# Application for a Prospecting Right and Associated Environmental Authorisation and Waste Management Licence (WML) for the Proposed Prospecting (With Bulk Sampling) for Alluvial Diamonds (Da), Kimberlitic Diamonds (Dk), Gravel (Grav), Sand General (Qy) and Potential Accompanying Trace Gold (Au) Ore on a Portion of Farm Mier 585 in the Dawid Kruiper Local Municipality , Northern Cape Province

## Draft EIA/EMPr Report

**DMR Reference Number: NC30/5/1/1/2/13169 PR**

**Report Prepared for**

## Temla 13 (Pty) Ltd

**Report Prepared by**

GEOLOGICAL CONSULTING SERVICES PTY (LTD)

**June 2023**

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| *Title:* | *Draft EIA/EMPr Report for the Application for a Prospecting Right and Associated Environmental Authorisation and Waste Management Licence (WML) for the Proposed Prospecting (With Bulk Sampling) for Alluvial Diamonds (Da), Kimberlitic Diamonds (Dk), Gravel (Grav), Sand General (Qy) and Potential Accompanying Trace Gold (Au) Ore on a Portion of Farm Mier 585 in the Dawid Kruiper Local Municipality, Northern Cape Province* |
| *Status of report:* | *Draft Report* |
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# *Executive Summary*

## *Introduction*

*Temla 13 (Pty) Ltd (Temla 13) appointed Ndi Geological Consulting Services (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to conduct the Prospecting Right (PR) / Environmental Authorisation (EA) / Waste Management Licence (WML) application processes for the project located in the Dawid Kruiper Local Municipality, within the ZF Mgcawu District Municipality (previously known as Siyanda District Municipality), Northern Cape Province (DMR Reference: NC30/5/1/1/2/13169PR).*

*The proposed prospecting project, which includes bulk sampling, will cover an area of ±1 870.6 hectares and is located less than 1km to the east of Rietfontein in the Northern Cape Province.*

*Temla 13 requires a prospecting right in terms of the Mineral and Petroleum Resources Development Act (Act No. 22 of 2002) (MPRDA). Before the prospecting right will be granted, Temla 13 must undertake an EA and WML application process in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM: WA). The competent authority for the environmental authorisation process is the Northern Cape Department of Mineral Resources (DMR).*

*The Department of Forestry, Fisheries, and the Environment (DFFE) has identified the need for the alignment of EA/WML processes and has promulgated a single environmental management system under NEMA whereby the DMR has become the competent authority for the authorisation of mining-related projects under the NEMA Environmental Impact Assessment (EIA) Regulations. This will result in simultaneous decisions in terms of NEMA, the NEM: WA and other environmental management acts.*

*The proposed project triggers activities listed in terms of Listing Notices 1, 2 and 3 of the NEMA and will therefore require an EA from the DMR. In addition, the proposed project also triggers activities listed in Category B of GNR 921 of the NEM: WA, which requires a WML from the DMR. Activities listed in Listing Notice 2 of the NEMA and Category B of GNR 921 of the NEM: WA require that a full EIA (Scoping and Impact Assessment Phases) be conducted. An integrated application for an EA and WML is being conducted, and a full EIA (Scoping and Impact Assessment) process is being followed.*

## *Who is conducting the EIA?*

*Ndi Geological Consulting Services (Pty) Ltd has been appointed by Temla 13 as the independent Environmental Assessment Practitioner (EAP) to conduct the PRA/EA/WML application processes for the project.*

*The reports and documentation for the integrated EA/WML application process will be compiled and finalised for submission to the DMR for the EA/WML in terms of the NEMA for consideration and decision making. The DMR will consult with other government authorities as required in terms of Section 24(K) of the NEMA.*

## *Who will evaluate the EIA?*

*Before the proposed development can proceed, approval must be obtained from the appropriate regulatory authorities. The Scoping Report and Plan of Study were and accepted by the DMR for review, allowing the current impact assessment phase of the project to proceed. The impact assessment phase entailed detailed specialist investigations, reporting and further stakeholder involvement. Currently the process is in its draft EIA/EMPr Report stage where the draft reports will need to be submitted to the*

*stakeholders for review and comment. Comments received will then be incorporated into the Final EIA/EMPr Report. Only once a Final EIA/EMPr Report has been submitted to DMR can a decision be taken by the Department as to whether the project may proceed or not.*

## *Description of the Proposed Development*

*The prospecting project will include:*

- *Prosecting and bulk sampling with pits and trenches;*
- *Ablution facility;*
- *Access roads;*
- *Diesel storage;*
- *Office site;*
- *Plant site;*
- *Slimes dam;*
- *Office Area; and*
- *Vehicle parking area.*

*The prospecting right will be required for five (5) years.*

## *Motivation for the Proposed Project*

- *For years, mining has been the driving force behind South Africa's economy and continues to make a valuable contribution to the country's economy. This economy is built on gold and diamond mining, with gold accounting for over a third of the country's exports. South Africa's diamond mining industry was recognised as one of the largest in the world in the year 2009. It is predicted that mining will still play an important role to the economy, most notably through foreign exchange earnings and employment provision. It is also one of the primary sectors that provide employment opportunities for unskilled and semi-skilled people. According to the Minerals Council in South Africa, in 2018 the mining sector contributed R351 billion to the South African Gross Domestic Product (GDP). A total of 456 438 people were employed in the mining sector in 2018 and each person employed in the mining sector has up to nine indirect dependants. Diamond mining's contribution to the GDP of South Africa is estimated to be at 18 % of the annual GDP.*

  *Sales of sand and aggregate have increased exponentially both in volume and value terms. This was attributed to strong growth in the construction sector which showed double digit growth since 2004. During the past five years, employment in the sand and aggregate industry increased by 11.3 percent and remuneration by 21.2 percent, attributed to improved data collection and the boom in the construction sector.*

  *The definition of prospecting in terms of the MPRDA states: "intentionally searching for any minerals by means of any method which disturbs the surface or sub-surface of the earth, including any portion of the earth that is under the sea or under other water…". Prospecting is the physical search for minerals, fossils, precious metals, or mineral specimens, which allows a company to survey or investigate an area of land for the purpose of identifying an actual or probable mineral deposit, before investments are made into the mining activities.*

*Assessment of the geological information available has determined that the area in question may have good quality diamond, sand, and trace gold reserves. In order to ascertain the above and determine the nature, location, and extent of the reserves within the proposed prospecting area, it will be necessary that prospecting be undertaken. The prospecting will also determine if there are any features that may have an impact on the economic extraction of the diamonds.*

*The information that will be obtained from the prospecting to be undertaken will be necessary to determine, should diamond reserves be found, how and where the diamonds will be extracted and how much economically viable reserves are available within the proposed prospecting area.*

*Should good quality diamond reserves be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued.*

*Temla 13 expects that benefits from the project will accrue to the immediate project area, the sub-region, and the province of the Northern Cape. This prospecting activity has a potential to temporarily contribute to decreasing unemployment rates in the surrounding areas, particularly during the construction and decommissioning phases of the project.*

*These potential benefits must be offset against the costs of the project, including the impacts to landowners and land occupiers. Further to the above, it has been determined that the prospecting project activities will not have a conflict with the spatial development plans for the Dawid Kruiper LM and ZF Mgcawu District Municipality, the Integrated Development Plans, and the Environmental Management Framework (EMF) for the affected municipalities.*

*A process that ensures consultation with Interested and Affected Parties (I&APs) for the project is being undertaken. The stakeholder engagement process is being conducted is a way to provide all I&APs with an opportunity to comment on the project, with several platforms that allow public commenting opportunities to be offered to the I&APs. All issues raised by the I&APs will be recorded and addressed throughout the EIA process.*

- *Environmental responsibility: It is expected that the prospecting activities will have negative environmental impacts, including, but not limited to the impacts that have been included in Section 13 of this report. However, due to the nature of prospecting, the impacts will be of short duration and limited locality.*

  *The impacts will be investigated in detail during the impact assessment phase of the project. Where possible, measures to mitigate the impacts of the project will be identified and will be finalised during the impact assessment phase of the project. The mitigation measures will include designs and management practices that will be embarked on, to prevent and/or minimise the identified impacts on the social, cultural, and environmental aspects. For each potential significant impact identified, mitigation measures will be specified. High level mitigation measures have been included in Section 13 of this report. These mitigation measures will be described in more detail in the EMPr that Temla 13 will be required to comply with throughout the prospecting period.*

  *The EMPr will also include environmental monitoring programme that will allow that Temla 13 to keep track of the impacts of the project on the environment and where required, to take remedial action.*

- *Socio-economic benefits: The proposed project will also result in job creation for local communities and a short-term boost for local businesses during the construction phase of the*

*project. The prospecting itself will be undertaken by specialised sub-contractors and it is not anticipated that employment opportunities will be created in the operational phase of the project.*

- *No go-Option: The option of not approving the activities will result in a significant loss of valuable information regarding the mineral status (in terms of diamond reserves), present on the identified properties. In addition, should economical reserves be present, and the applicant does not have the opportunity to prospect the opportunity to utilize these reserves for future phases and the potential positive socio-economic impacts that would result from the resultant mining project will be lost.*

## *Alternatives Considered*

*The alternatives considered were as follows:*

- *Location: The location of the proposed project components is constrained to the location with potential for the mineral resources (Diamond (Alluvial and Kimberlitic), Sand, Gravel, Trace Gold reserves). The Project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting. In addition few fragments of severely weathered kimberlite were collected during site visit within project area. This confirms kimberlite presence within target area. Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous. Gravels moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades. As such, no property alternatives were viable to be considered for this project.*

- *Type of Activity: An alternative to the type of activity would be agriculture. According to the Integrated Development Plan (IDP) for the Dawid Kruiper Local Municipality, the unemployment rate (particularly the youth unemployment rate) in the municipal areas is very high. Diamond mining in the Rietfontein area seems to be a viable option for future development and special policies are included for handling mining land uses in the future. A study done by the DBSA indicated that several minerals can be found in Rietfontein area, with different potential levels for mining. The IDP further states that although the municipality is currently focused on agriculture, there is risk that seasonal changes, drought, flooding, weather extremes and changes in the world economy and politics may have severe impacts on the lives of the local communities. The municipality is focusing on the structuring of the SDF to handle and accommodate the possibility of mining activities outside of the identified areas of the SDF, while protecting the core and buffer areas. The land use alternatives will be investigated in more detail in the impact assessment phase of the process.*

- *Design or Layout of the Activity: Since no complicated surface infrastructure will be required for this project no design and layout alternatives for the proposed project were determined. The applicant will revise the layout of the project should there be fatal flaws identified. This will be assessed in detail during the impact assessment phase of the project.*

- *The Technology to be used in the Activity: In terms of the proposed technologies, these have been chosen based on long term proven success in prospecting. The prospecting activities proposed in the Prospecting Works Programme (PWP) are dependent on the preceding phase (desktop studies), therefore no alternatives have been indicated. The location of the intrusive*

*drilling activities will be determined during Phase 1 of the Prospective Works Programme. All infrastructure will be temporary and/or mobile.*

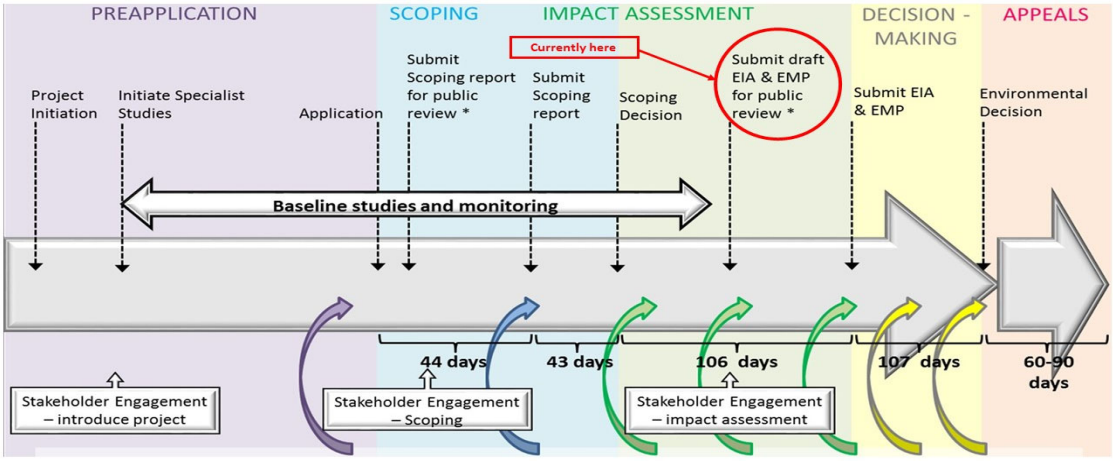
- *The Operation Aspects of the Activity: No permanent services in terms of water supply, electricity, and or sewage facilities will be required. Temporary access roads will however be constructed in areas where there are no existing access routes. The activities will commence with Phase 1 and undertaken as described in Section 5.*
- *No-go Option: The option of not approving the activities will result in a significant loss of valuable information regarding the mineral status (in terms of Diamond (Alluvial and Kimberlitic), Sand, Gravel Trace Gold), present on the identified properties. In addition, should economical reserves be present, and the applicant does not have the opportunity to prospect, the opportunity to utilize these reserves for future phases will be lost.*

*It must be noted that, the additional potential negative impacts on the environment associated with prospecting as assessed in Section 13 would not exist should the project not be implemented. The environmental, social, and economic impacts have been assessed in detail and included in Section 13.*

## *Environmental Impact Assessment Process*

*An EIA seeks to identify the environmental consequences of a proposed project from the beginning, and helps to ensure that the project, over its life cycle, will be environmentally acceptable, and integrated into the surrounding environment in a sustainable way. The project triggers activities listed in Listing Notices 1, 2 and 3 of the NEMA and Category B of GNR921 of the NEM: WA and requires that a full EIA (scoping and impact assessment phases) be conducted.*

*A summary of this process is shown in Figure ES-1.*

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SIMPLIFIED EIA PROCESS

***Figure ES-1: Illustration of the EIA process to be followed***

## *Stakeholder Engagement Process*

*Activities that have been undertaken for the public involvement process during the scoping phase are:*

- *Identification of I&APs and development of a stakeholder database: I&APs were identified using GIS and cadastral information to identify affected and adjacent properties. The affected and adjacent property owners were identified using the surveyor general website, www.deedsweb.gov.za. In addition, registered I&AP's were also sourced from responses to the advertisements, site notices and written notification to I&AP's associated with the project. The I&APs register will be maintained for the duration of the study where the details of stakeholders are captured and automatically updated upon communication to the EAP. The identification, registration, and comments from I&APs will be an on-going activity.*

*The opportunity to participate in the EIA and to register as an Interested and Affected Party (I&AP) was announced through the following means:*

- *Letter of invitations to register and background information documents;*
- *Newspaper advertisements;*
- *Site notices erected at several places in and around the proposed prospecting area;*
- *Collation of comments received into a Comments and Responses Register (CRR); and*
- *Obtaining and documenting registration and comment sheets.*

*The Draft Scoping Report was made available for a 30-day commenting period between 16 September 2022 and 17 October 2022. All issues, comments and suggestions received from stakeholders were reviewed and collated into a comments and responses table. Where necessary, comments from stakeholders have also been incorporated into the Final Scoping Report that will be submitted to the DMR for decision-making. A public meeting was held during the Scoping Phase of the project where the stakeholders were provided with a brief description of the proposed project and were provided with an opportunity to comment and raise issues that may need to be included in the impact assessment phase. All comments received to date have been included in this draft EIA/EMPr Report.*

*During the EIA phase, stakeholder engagement will entail:*

- *Notification of the availability of the Draft EIA/EMPr Report for review and comment;*
- *The 30-day review and comments period between 23 June 2023 and 24 July 2023;*
- *Public Meeting to be held wit stakeholders during the review and comment period; and*
- *Updating of the comments and responses table.*

*The stakeholders will be notified of DMR's final decision on the project once it has been communicated to the EAP and applicant (Temla 13).*

## *Profile of the receiving environment*

*A summary of the main baseline aspects is included in Table ES-1, with more detail included in Section 10 of the report*

***Table ES-1: Summary of the Profile of the Receiving Environment***

| ***Aspect*** | ***Description*** |
|---|---|
| *Geographical* | *The proposed project is located within the Northern Cape Province, under the jurisdiction of the ZF Mgcawu District Municipality (previously known as Siyanda* |

| ***Aspect*** | ***Description*** |
|---|---|
| | *District Municipality. The affected property (Farm Mier 585) is located less than 1km to the east of Rietfontein.*<br><br>*The Dawid Kruiper Local Municipality is a Category B municipality that forms part of the ZF Mgcawu District in the Northern Cape.* |
| *Topography* | *The topography of the site is described as flat, with the elevation lying between 820 and 840 metres above mean sea level (mamsl).* |
| *Climate* | *The study area is within the Dawid Kruiper LM which experiences summer rainfall region of South Africa which commences in October and ends in April. The peak rainfall months are November to April while the lowest rainfall months are July and August. Rainfall in the Dawid Kruiper municipality is already very variable, ranging from 20-300mm per year, and very low compared with the rest of South Africa. There are already noticeable water constraints that impact on the ability of the municipality to deliver water services effectively. Median and worst-case scenarios predict a decrease in rainfall for winter rainfall areas such as this, with average annual rainfall projected to decrease by up to 30% along the west coast by 2100. This drying trend is particularly strong towards the end of the rainy season. A best-case scenario to 2050 indicates there may be some early increase in rainfall, followed by drying later as frontal systems shift southwards. There are likely to be more frequent and more intense rainfall related extreme weather events such as droughts and storms. Dawid Kruiper is already drought prone, and while little change is projected in the immediate future, droughts are expected to increase in frequency and severity by up to 50% towards the end of the century.* |
| *Geology* | *The Project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting.*<br><br>*Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous.*<br><br>*Gravels Moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades.* |
| *Land use and land capability* | *The current landuse on the affected properties is agriculture. It is expected that due to the low rainfall and high temperatures and evapotranspiration, the agriculture potential of the area is low. There is a residential area (Rietfontein) located less than 1km from the proposed prospecting area.* |
| *Biodiversity* | • *Biomes: The proposed prospecting area is located in the Nama-Karoo Biome). The Nama-Karoo flora is not considered particularly rich and does not contain any centre of endemism. The local endemism of the biome is very low compared to other biomes. The Nama-Karoo is a complex of extensive plains, dominates by low (dwarf) shrubs, intermixed with grasses, succulents, geophytes, and annual forbs. Small trees occur only along drainage lines or on rocky outcrops.* |

| *Aspect* | *Description* |
|---|---|
| | • *Bioregion: The proposed prospecting area is located in the Bushmanland Bioregion. The Bushmanland Bioregion occurs from the north-eastern part of the Namaqualand area in the west to around Prieska in the east and from around Upington in the north to the Brandvlei/Sak River vicinity in the south.*<br>• *Vegetation with threatened ecosystems: According to the SANBI database, there are no remaining natural vegetation in the proposed project area.*<br>*The prospecting area is located within the Kalahari Karroid Shrubland. All the ecosystems are considered least threatened.*<br>*Flora:*<br>• *The natural veld encountered on site can be described as a sparse karroid-type vegetation on a very rocky substrate. The vegetation structure is that of a hardy drought resistant shrubland (apart from single Prosopis trees next to some of the seasonal streams). Species diversity was low but very homogeneous, dominated by a combination of the following: Rhigozum trichotomum (forming only a low shrub), Thesium lineatum, Acacia hebeclada, Kleinia longiflora, Monechma species, Hermannia species (no flowers), Aptosimum spinescens, Geigeria filifolia, Blepharis mitrata and Ziziphus mucronata (occasionally near seasonal streams.*<br>• *No floral species of special concern were observed onsite, this may be attributed to the ongoing land uses and the land transformation.*<br>• *No Plant Species with Ethnobotanical value was observed onsite during the site inspection.*<br>• *Invasive Alien Infestation: A number of Prosopis glandulosa (a category 2 invader) were encountered scattered on both sites. According to Regulation 15 and 16 of CARA all category 2 plants have the proven potential of becoming invasive but may have certain beneficial properties. The regulations make provisions for category 2 plants to be retained in special areas demarcated for that purpose, but those occurring outside demarcated areas must be controlled. The specialist recommends that all Prosopis individuals should be removed on both sites and its immediate surroundings.*<br>*Fauna:*<br>• *According to the desktop study conducted, there are nine Red List mammal species that have a high chance of occurring in the study area. Cattle and other domestic animals graze in the property. None of the sensitive mammals which were expected were spotted on site.*<br>• *Reptiles: There are three Red List reptile species that could occur in the study area, i.e., the African rock python, the Swazi rock snake and the variegated wolk snake. All three of these have a high chance of occurring in the study area, on the basis of habitat requirements and are most likely to occur in rocky habitats, either on rocky outcrops or in rocky, well wooded valleys. None of the expected reptiles were observed on site during the site visit.*<br>• *Avifauna: According to the South African Bird Atlas Project (SABAP2), almost 300 species of birds have been identified in the area. A few avifaunal* |

| ***Aspect*** | ***Description*** |
|---|---|
| | *species were observed during the site inspection. The prospecting operation may generate noise pollution which serves as a deterrent to birds.*<br>• *Invertebrates: No evidence of invertebrates was observed onsite.* |
| *Heritage Resources* | *The Northern Cape is rich in archaeological sites and landscapes that reflect the complex South African heritage from the Stone Age to Colonial history. Within the region, Stone Age sites and complexes have been, and are still being investigated in some detail. A site specific HIA conducted by a specialist as part of the impact assessment phase found the following:*<br>• *Archaeology: The study identified isolated lithic tools mainly occurring on eroded sections of the study site. The lithic tools were probably washed from their original sites as such they lack provenance. Based on the field study results and field observations, the receiving environment for the proposed prospecting site is low to medium potential to yield previously unidentified archaeological sites during prospecting.*<br>• *Burial grounds and Graves: The field survey identified one cemetery within the proposed prospecting site. The cemetery caters for Rietfontein residents, and it is well known. It has more than 200 graves which are marked by oval shaped stone piles, tombstones and inscribed headstones, brick lining and cement plaster. Th cemetery will be protected from the proposed project by way of providing for a 100m buffer zone from the identified burial site. The possibility of encountering previously unidentified burial sites is low within the proposed prosecting site, however, should such sites be identified during prospecting, they are still protected in terms of Section 36 of NHRA.*<br>• *Public Monuments and Memorials: There are no public memorials and monuments within the proposed prospecting site. As such the Prospecting Right Application (PRA) may be approved without any further investigation and mitigation in terms of Section 27 and of the NHRA.*<br>• *Buildings and Structures: There is a farm structure which was confirmed to be younger than 60 years. Based on the satellite imagery and historical maps, the farm structure is younger than 60 years old. As such, in terms of Section 34 of the NHRA the Prosecting Right Application may be approved without any further investigation and mitigation.* |
| *Palaeontology* | *The development is taking place on the Tertiary to Quaternary and the Karoo Supergroup. Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity is generally low to very high. According to the palaeontology assessment, the project includes one locality option with a high and low palaeontological sensitivity.* |
| *Noise* | *A noise impact assessment was undertaken as a specialist study. The assessment included ambient noise measurements The methods for measurement and rating of environmental noise were carried out in accordance with SANS 10103:2008, which provides a guideline on how environmental noise measurements are to be taken and analysed.* |

| ***Aspect*** | ***Description*** |
|---|---|
| | • *Day Time Ambient Noise Monitoring Results: The results from the daytime ambient noise monitoring show that the current noise levels in the area generally comply with the SANS 10103:2008 limits of 45dB, with all the monitoring sites, except one, recording ambient levels of less than 45bB.*<br>• *Night-time Ambient Noise Monitoring Results: The results from the night-time ambient noise monitoring show exceedances of the SANS 10103:2008 limits of 35dB at 3 of the 8 monitoring sites.* |
| *Wetlands* | *Two unchannelled valley bottom wetlands HGM 1 and HGM 2 were identified on the north of the prospecting right boundary. Unchannelled valley bottom wetlands are characterised by their location on valley floors and the absence of a channel flowing through the wetland. Four valley head seeps HGM 3, HGM 7, HGM 11 and HGM 12 were identified in the centre of the prospecting right area. Six Flat wetlands HGM 4, HGM 5, HGM 6, HGM 8 and HGM 10 were also identified within the centre of the prospecting right area, while one Depression HGM 13 was identified within the southwest of the prospecting right boundary. Dominant water inputs to these wetlands are from/into a channel, in this instance an upstream source, flowing through the wetland either as surface flows resulting from flooding or as subsurface flow. Water generally moves through the wetland as diffuse surface flow although occasionally as short-lived concentrated flows during flood events.*<br><br>*According to the wetlands assessment, the Ecological Sensitivity and Importance (EIS) of the wetlands has generally been recorded as moderate to low and the Ecological Services as intermediate. Although no red-data species were identified during the site investigation, the majority of unchannelled valley bottom systems usually, provide habitat for a number of floral and faunal species.*<br><br>*The Present Ecological Status of all the wetlands was classified as C-moderately modified.* |
| *Visual* | *According to the visual impact assessment, a visual impact will only occur if there are sensitive receptors present in the area to observe or experience the impact. The desktop and field assessment found that the prospecting right activity is situated within a remote area, where there is a very limited number of receptors present adjacent to the Rietfontein Community. Furthermore, the processing plant and roadway are considered moderately sensitive receptors although workers within the prospecting right area they will have a limited view time of the surroundings.* |
| *Conservation Plan* | *The Northern Cape Provincial Biodiversity Conservation Plan classifies portions of the prospecting area as being Critical Biodiversity Areas (CBAs) 1 and 2 (Critical Biodiversity Areas are areas required to meet biodiversity targets for ecosystems, species, and ecological processes, as identified in a systematic biodiversity plan) and the remaining areas as Other Natural Areas (ONA).* |
| *Protected Areas* | *There are no protected areas or important bird areas affected by the proposed prospecting activities. The Kalahari Gemsbok Park is located approximately 60km to the north of the prospecting area* |

| *Aspect* | *Description* |
|---|---|
| *Surface water* | *The study area is located in quaternary catchment area D42B in the Lower Orange Management Area (WMA). There are a number of rivers and tributaries that traverse the project area.* |
| *Groundwater* | *According to the DWS National Groundwater Archives the groundwater in the area is classified as follows:*<br>• *Groundwater Recharge: due to the dry and hot climate in the area, the groundwater recharge is considered low, between 0 and 100mm/yr.*<br>• *Groundwater Quality: The groundwater in the area is generally of poor quality, with Electrical Conductivity (EC) levels between 300 and 1 000 mS/m. Some sections of the prosecting area have groundwater quality with EC levels >1000mS/m.*<br>• *Groundwater Yield: The proposed prospecting area is characterised by high yielding groundwater (Fractured aquifers with recharge 2.0ℓ/s to 5.0ℓ/s.*<br>• *Hydrocensus: According to the DWS, there are 5 boreholes within a 1km radius of the project site and 22 boreholes within the 5km radius of the site*. |

## *Anticipated Impacts*

*Risks and potential impacts were categorised according to the type of activity undertaken and the relation to each environmental variable. Findings from specialist studies were incorporated into this EIA/EMPr Report. The following impacts as described in Table ES-2 are anticipated because of the construction, operation, and decommissioning phases of the project:*

***Table ES – 2: Anticipated Impacts***

| *Element of Environment* | *Potential Impact Descriptions* |
|---|---|
| *Socio-Economic* | *Possible job opportunities during the construction and operation.* |
| *Hydrogeology* | *Possible groundwater contamination.* |
| *Surface water* | *Possible surface water contamination.* |
| *Aquatic ecosystems and riparian areas* | *Possible impacts on aquatic ecosystems and riparian areas* |
| *Air Quality* | *Possible impact on air quality in the area.* |
| *Climate Change* | *Possible contribution to climate change through emission of Green House Gases* |
| *Vibrations* | *Possible impacts on private properties and fauna due to vibrations during drilling* |
| *Noise* | *Possible generation of noise during construction and operation.* |
| *Soils/Land Use/Land Capability* | *Loss of soil resource and change in land capability and land use.* |
| *Biodiversity* | *Disturbance and loss of biodiversity, especially SCC.* |
| *Aquatic ecology* | *Possible loss, sedimentation, and contamination of aquatic resources* |
| *Heritage* | *Possible impact on heritage and cultural resources (including graves) in the area.* |
| *Traffic* | *Potential safety issues due to the increased traffic.* |
| *Cumulative Impacts* | *Cumulative Impacts* |

## *Specialist Studies*

*Specialist studies contained in the Scoping Report and Plan of study were conducted to assess the anticipated impacts. All specialists assessed the impact (including cumulative) of each proposed activity/aspect in relation to the construction, operation, closure, and decommissioning phases and developed appropriate mitigation measures that can be implemented to reduce or eliminate the potential impacts identified.*

## *Quantification of Impacts*

*The anticipated impacts associated with the proposed project were assessed according to Ndi Geological Consulting Services (Pty) Ltd.'s standardised impact assessment methodology which is presented in Section 12. This methodology has been utilised for the assessment of environmental impacts where the consequence (severity of impact, spatial scope of impact and duration of impact) and likelihood (frequency of activity and frequency of impact) have been considered in parallel to provide an impact rating and hence an interpretation in terms of the level of environmental management required for each impact.*

## *Summary of the Impact Assessment Process*

*This section contains the assessment of potentially positive and negative environmental impacts that could possibly be caused by the proposed project.*

*The impacts are linked to the activities conducted for the proposed development, broadly relating to construction, operational and decommissioning phases. Specific emphasis was placed on any relevant environmental, social, and economic impacts identified by the specialist studies, comments received during the stakeholder engagement process, issues highlighted by relevant authorities; as well as professional judgement of the EAP team through appraisals on the project description, listed activities and the environment.*

*The objectives for each of the potential environmental impacts identified was to determine their significance and to identify mitigation measures that may be implemented to reduce the impacts to an acceptable level where required.*

*The impacts evident from the detailed impact assessment (Section 13) of the proposed project are both positive and negative in nature.*

## *Key Positive Impacts After Mitigation*

*The main positive impacts identified for the project relate to socio-economic impacts that the construction and operation of proposed prospecting project will have. The proposed project will result in the prospering activities being undertaken for 5 years. These impacts were determined to have a positive impact, either directly or through the spinoffs generated by the development and operation of the proposed project and associated infrastructure.*

*In terms of local economy, there is the potential for multiple significant benefits to both local and regional businesses, as well as local employment opportunities. This would be highest, but temporary, during the construction phase, due to the requirement of contractors for services and materials. This has opportunities for both the formal and informal sectors, as smaller enterprises, including spaza shops, are likely to be established during the construction period to supply contractors and others with food and other amenities.*

*It is expected that Temla 13 will implement a policy allowing for preferential procurement for the local businesses and training of local Small, Medium, and Micro-sized Enterprises (SMME) on procurement and business management.*

*The project is expected to have a positive socio-economic benefit through short term employment of locals. Recruitment of labour will be guided by Temla 13's recruitment policies which are expected to promote the employment of local labour by Temla 13 as well as by any appointed contractors. Temla 13 will ensure that a transparent process of employment will be followed to limit opportunities for conflict that may arise.*

*The information that will be obtained from the prospecting to be done will be necessary to determine, should minerals be found, how and where the different minerals will be extracted and how much economically viable reserves are available within the proposed prospecting area. This will allow Temla 13 to enter into further studies towards a Mining Right.*

*Should minerals be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued. Temla 13 expects that substantial benefits from the project (should minerals be found) will accrue to the immediate project area, the sub-region, and the province. This prospecting activity has a potential to decrease level of unemployment rate in proposed areas and surroundings. This prospecting activity will bring revenue into the city and the province which will in turn boost the economy of the country.*

## *Key Negative Impacts After Mitigation*

*During the proposed prospecting operation impacts may occur on soils, natural vegetation, surface water, groundwater, sensitive landscapes, air quality, noise, visual aspects, and sites of archaeological and cultural importance should the EMPr not be adhered to.*

*Temla 13 will undertake measures to ensure that the identified impacts are minimised. Assessment of the impacts with the proposed mitigation measures has shown the significance of the impacts on all affected environmental aspects to be reduced from medium and low to low and negligible significance.*

*Land use will not materially change. Landowners and land occupiers within the proposed project area may be affected although on a temporary basis due to the need to access the sites and the establishment and use of the campsite. Measures such as safety along the roads and dust suppression will be undertaken to ensure that the impacts on the landowners and land occupiers are minimised.*

*Storm water runoff from the dirty water areas of the drilling sites, its associated surface infrastructure (campsite) may have a detrimental impact on the surrounding environment, wetlands, and water resources, particularly the wetlands located on the property should this water be released to the environment. In order to prevent the occurrence of the above-mentioned impacts, a stormwater management plan will be compiled based on the conceptual stormwater management plan included in Section 10 and implemented. Sediments will be created from the site during the construction, operational and decommissioning phase, which may impact negatively on the surrounding environment. The sediments will be treated should they contain hydrocarbon waste.*

*The employees will undergo training and will be given strict instruction not to undertake activities that will affect the environment and that may have an impact on the landowners. Waste generated from the site will be collected in proper receptacles and disposed of at registered waste disposal sites.*

*Key findings of the EIA include:*

- *All the identified impacts will be localised, short term and will have a medium and low significance. The significance of potential environmental impacts can be reduced to medium-low and low significance with implementation of mitigation measures and monitoring.*
- *Socio – Economic: Transportation of material to and from the study area will result in additional trucks and construction vehicles on the study area roads, which can cause damage to the road surface and increase the potential for accidents in the area. The influx of additional people looking for employment will result in impacts on the social dynamics in the area.*
- *Groundwater Impacts: Local spillages of hydrocarbons and chemicals used during the pre-construction and construction phase which may leach to groundwater. There is potential for leakages, spillages, and seepage of groundwater contaminants from infrastructure including the slimes dams and waste rock dump area.*
- *Surface Water: There are a number of watercourses that traverse the project area. Movement and use of vehicles and machinery as well as improper storage of hazardous substance may have Impacts on surface water and groundwater quality due to accidental spillages of hazardous substances. Contaminated dirty water runoff from the prospecting area to surrounding areas resulting in the impact on local surface water quality. A stormwater management plan will be compiled and implemented to ensure that water resources are protected. The removal or containment of dirty water will result in the removal of MAR from the catchment, as this runoff will now be considered dirty water and will need to be contained.*
- *The main cause of impacts to archaeological sites is direct, physical disturbance of the archaeological remains themselves and their contexts. The primary impacts are likely to occur during clearance and drilling, indirect impacts may occur during movement of heavy prospecting vehicles. Similarly, the clearing of access roads and campsites will impact material that lies buried in the topsoil. It is important to note that due to the localised nature of archaeological resources, that individual archaeological sites could be missed during the survey, although the probability of this is very low within the proposed prospecting site. Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during surface clearance. The purpose of the AIA is to assess the sensitivity of the area in terms of archaeology and to avoid or reduce the potential impacts of prospecting by means of mitigation measures (see appended Chance Find Procedure). There is still a possibility of finding archaeological remains buried beneath the ground.*
- *The heritage study identified a burial sites located on the project site. The implementation of the 100m buffer will ensure that gravesite is protected.*
- *Palaeontology Impacts: Sealing-in or destruction of the fossils during earth moving activities. Implementation of the mitigation measures in the specialist studies report and Section 13 of this report will reduce the potential for loss of fossils.*
- *There are a number of wetlands located on the property. The ecological significance of the watercourses should be viewed in the context of the overall level of functionality of the wetland. The study site is located within an area that is regarded as sensitive from a wetland point of view, and thus extra caution is required at every phase of the project. It is important to note that Wetlands are also protected under the National Water Act, and the Act makes no distinction between degraded and non-degraded wetlands in terms of their importance. As a result, the relevant legal requirements should be adhered to, and the relevant stakeholders involved in the project. All invasive alien vegetation on the property must be removed and eradicated. A buffer area of 32m around all the identified wetlands shall be demarcated as no-go zone where no*

*infrastructure, access and project activities may be permitted. Temla 13 will also ensure proper management and implementation of mitigation measures to avoid edge effects of activities on the wetlands.*

- *Air Quality Impacts: The movement of vehicles in the area will have an impact on ambient air quality as follows:*
    - *Possible increase in dust generation, $PM_{10}$ and $PM_{2.5}$ as a result of bulk earthworks, operation of heavy machinery, and material movement.*
    - *Increase in carbon emissions and ambient air pollutants ($NO_2$ and $SO_2$) as a result of movement of vehicles and operation of machinery/equipment*.
- *Visual Impacts due to:*
    - *Visual intrusion as a result of the movement of machinery, presence of drill rigs, and the erection of contractor camps;*
    - *Scaring of the landscape as a result of the clearance of vegetation and preparation of the prospecting areas; and*
    - *Indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site area.*
- *Noise Impacts: The use of vehicles and machinery during the construction phase may generate noise in the immediate vicinity. Prospecting activities will result in an increase in ambient noise levels as a result of the prospecting activities.*
- *Cumulative noise, visual and air quality (dust) impacts are deemed to not be significant (low) when proper mitigation measures are implemented.*
- *Vegetation loss is unavoidable during the construction phase of the project. This will however be limited to the footprint of the infrastructure (access roads, camp, boreholes). Care must be taken to manage any species of special concern as well as the proliferation of alien invasive plant species.*

*The residual risk associated with the proposed project will largely relate to water management and rehabilitation following the operational phase. According to the hydrology specialist study, should the identified mitigation measures be implemented, the anticipated decrease in water quality attributable to increased pollutant load could be greatly reduced. Accordingly, the impact significance on drainage lines and wetlands downstream could be classified as minor during the construction and operation phases of the project, and negligible significance during the decommissioning phase. These monitoring requirements have been addressed in the EMPr.*

*The main impacts that will result from the closure phase will relate to the ineffectiveness of the construction and operational phases to eradicate alien vegetation, which will ultimately result in the loss of indigenous fauna and flora. In addition, the decommissioning activities may further impact on the established vegetation in the area, resulting in the loss of biodiversity species, habitats, and ecological structure. All the impacts that may result from the decommissioning activities of the proposed project have been effectively addressed in the impact assessment in Section 13.3, as well as the EMPr.*

## *Closure and Decommissioning*

*During the decommissioning phase positive impacts will occur from rehabilitation activities including the restoration of land capability to its pre-prospecting state or agreed upon alternative, the restoration of vegetation and habitat types as well as the rehabilitation of infrastructure footprint areas. Alternatively,*

*should good quality minerals be found in the project area, Temla 13 will be able to mine the available reserves.*

*The main impacts that will result from the closure phase will relate to the ineffectiveness of the construction and operational phases to eradicate alien vegetation, which will ultimately result in the loss of indigenous fauna and flora. In addition, the decommissioning activities may further impact on the established vegetation in the area, resulting in the loss of biodiversity species, habitats, and ecological structure. The other expected negative impacts are associated with the movement of machinery to dismantle and remove equipment and infrastructure and rehabilitate the disturbed areas. Negative impacts resulting from soil loss, erosion and dust emissions were also identified.*

*The residual risk associated with the proposed project relates to water management and rehabilitation following the operational phase.*

*Post closure monitoring is essential to determine if rehabilitation was successful and sustainable.*

*A summary of the impact assessment results is provided in Table ES-3.*

***Table ES – 3: Summary Quantitative Impact Assessment Results***

| PHASE | ENVIRONMENTAL ASPECT | NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|
| PRE-CONSTRUCTION AND CONSTRUCTION | Socio-economic | Influx of job seekers will have a negative social impact on the landowners and land occupiers. | Medium Low (-) | Low (-) |
| | | Unauthorised access to private property outside of the demarcated areas will result in conflict with landowners. | Medium Low (-) | Low (-) |
| | | Increased traffic in the area will increase the likelihood of accidents on the roads, posing a health and safety issue for the landowners and land occupiers. | Medium Low (-) | Low (-) |
| | | The influx of job seekers in the area may result in an increase in petty crimes. | Medium Low (-) | Low (-) |
| | | Ineffective communication channels leading to community unrest. | Medium Low (-) | Low (-) |
| | | Negative impact as a result of the dissection of land by clearing and excavations for construction of infrastructure, constraints to access to farmland to farmers, impacting on day-to-day farm activity. | Medium Low (-) | Low (-) |
| | | Possible boost in short term local small business opportunities. | Low (+) | Low (+) |
| | | Possible creation of short-term employment for locals | Low (+) | Low (+) |
| | Groundwater | Localised spillages of oils from machinery leaching to groundwater contamination. | Medium Low (-) | Low (-) |
| | | Existing boreholes within the prospecting area may create conduits of flow to the groundwater unless sealed. | Medium Low (-) | Low (-) |
| | Surface Water | Increase in silt load in runoff due to site clearing, grubbing and the removal of topsoil from the footprint area associated with the drill sites and associated infrastructure. | Medium Low (-) | Low (-) |
| | | Potential deterioration in water quality due to the potential accidental spillages of hazardous substances. | Medium Low (-) | Low (-) |

| PHASE | ENVIRONMENTAL ASPECT | NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|
| | | *Debris from poor handling of materials and/or waste blocking watercourses, resulting in flow impediment and pollution.* | *Low (-)* | *Low (-)* |
| | | *Contaminated dirty water runoff to surrounding areas resulting in the impact on local surface water quality.* | *Medium Low (-)* | *Low (-)* |
| | | *Increase of surface runoff and potentially contaminated water that needs to be maintained in the areas where site clearing occurred.* | *Medium Low (-)* | *Low (-)* |
| | *Aquatic Ecosystems* | *Localised changes to the wetland areas as a result of vegetation clearing.* | *Medium Low (-)* | *Low (-)* |
| | | *Loss of habitat and aquatic ecological structure as a result of site clearance activities and uncontrolled aquatic ecosystem degradation.* | *Medium Low (-)* | *Low (-)* |
| | | *Impact on the aquatic ecological systems as a result of changes to the sociocultural service provisions.* | *Medium Low (-)* | *Low (-)* |
| | | *Increased runoff due to topsoil removal and vegetation clearance leading to possible erosion and sedimentation of wetland resources.* | *Medium Low (-)* | *Low (-)* |
| | | *Soil compaction and levelling as a result of construction activities and vehicle movement leading to loss of wetland habitat.* | *Medium Low (-)* | *Low (-)* |
| | | *Impact on the hydrological functioning of the aquatic ecosystems.* | *Medium Low (-)* | *Low (-)* |
| | *Heritage Resources* | *The proposed project has the potential to impact on local burial site within the area.* | *Medium Low (-)* | *Low (-)* |
| | | *The proposed project has the potential to impact on sites of archaeological importance.* | *Low (-)* | *Low (-)* |
| | *Palaeontological Resources* | *Drilling of exploratory boreholes has potential to impact on palaeontological resources* | *Low (-)* | *Low (-)* |
| | *Flora* | *Loss of localised biodiversity habitats within sensitive areas due to site clearance and establishment of drill sites and access roads.* | *Medium Low (-)* | *Low (-)* |
| | | *Loss of localised floral species diversity including RDL and medicinal protected species due to site clearance and site establishment.* | *Medium Low (-)* | *Low (-)* |
| | | *Potential spreading of alien invasive species as indigenous vegetation is removed, and pioneer alien species are provided with a chance to flourish.* | *Medium Low (-)* | *Low (-)* |
| | *Fauna* | *Vegetation clearance may result in loss of faunal habitat ecological structure, species diversity and loss of species of conservation concern.* | *Low (-)* | *Low (-)* |

| PHASE | ENVIRONMENTAL ASPECT | NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|
| | | *Habitat fragmentation as a result of construction activities of the access roads leading to loss of floral diversity.* | *Low (-)* | *Low (-)* |
| | | *Loss of faunal diversity and ecological integrity as a result of construction activities, erosion, poaching and faunal specie trapping.* | *Low (-)* | *Low (-)* |
| | | *Movement of construction vehicles and machinery may result in collision with fauna, resulting in loss of fauna.* | *Low (-)* | *Low (-)* |
| | *Air Quality* | *Possible increase in dust generation, $PM_{10}$ and $PM_{2.5}$ as a result of bulk earthworks, operation of heavy machinery, and material movement.* | *Medium Low (-)* | *Low (-)* |
| | | *Increase in carbon emissions and ambient air pollutants ($NO_2$ and $SO_2$) as a result of movement of vehicles and operation of machinery/equipment.* | *Medium Low (-)* | *Low (-)* |
| | *Visual* | *Scaring of the landscape as a result of the clearance of vegetation.* | *Medium Low (-)* | *Low (-)* |
| | | *Visual intrusion as a result of the movement of machinery and the establishment of the required infrastructure.* | *Medium Low (-)* | *Low (-)* |
| | | *Indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site area.* | *Medium Low (-)* | *Low (-)* |
| | | *Improper waste management will also increase the impacts of visual impacts onsite.* | *Medium Low (-)* | *Low (-)* |
| | *Noise* | *The use of vehicles and machinery during the construction phase may generate noise in the immediate vicinity.* | *Medium Low (-)* | *Low (-)* |
| | *Soil, Land use and Land Capability* | *Localised chemical pollution of soils as a result of vehicle hydrocarbon spillages and compaction.* | *Low (-)* | *Low (-)* |
| | | *Localised clearing of vegetation and compaction of the construction footprint will result in the soils being particularly more vulnerable to soil erosion.* | *Low (-)* | *Low (-)* |

| PHASE | ENVIRONMENTAL ASPECT | NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|
| | | *Localised loss of resource and its utilisation potential due to compaction over unprotected ground/soil.* | *Low (-)* | *Low (-)* |
| | | *Localised loss of soil and land capability due to reduction in nutrient status - de-nitrification and leaching due to stripping and stockpiling footprint areas.* | *Low (-)* | *Low (-)* |
| | *Traffic* | *Increase in traffic volumes as a result of pre-construction activities which may lead to an increase in traffic congestion along the public roads as well as the farm roads around the prospecting area.* | *Medium Low (-)* | *Low (-)* |
| | *Climate* | *Emissions of Green House Gases as a result of the use of plant, heavy moving machinery, generators etc.* | *Low (-)* | *Low (-)* |
| | *Waste Management* | *Potential water and soil pollution as a result of inappropriate waste management practices.* | *Medium Low (-)* | *Low (-)* |
| ***OPERATIONAL*** | *Socio-Economic* | *Operation may affect the day-to-day operation of the landowners hence result in direct impact on their livelihood.* | *Low (-)* | *Low (-)* |
| | | *Uncontrolled access of private property during operation may result in conflict with affected landowners and occupiers.* | *Low (-)* | *Low (-)* |
| | | *Negative impact as a result of additional trucks on the roads, impacting on local communities' health and safety.* | *Low (-)* | *Low (-)* |
| | | *Negative impact on, local community health and safety due to potential influx of employees, the presence of job seekers, which may lead to prostitution and conflict with the local communities. Illegal informal settlement of job seekers in the area may exacerbate the situation.* | *Low (-)* | *Low (-)* |
| | | *Negative impacts on local communities and livestock and safety due to the presence of pits used for bulk sampling* | *Low (-)* | *Low (-)* |
| | | *As a result of drilling activities during operation, potential damage to adjacent landowner's/occupiers' infrastructure* | *Low (-)* | *Low (-)* |
| | | *As a result of drilling, there is potential for the occurrence of subsidence, impacting on the safety surface land dwellers and users.* | *Low (-)* | *Low (-)* |

| PHASE | ENVIRONMENTAL ASPECT | NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|
| | *Groundwater* | *The use of vehicles during the drilling of the exploration boreholes may result in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination of the vegetation cover and soils. The material removed from the drilling exercises will contain carbonaceous material, which has a potential for pollution should it be allowed stay for a prolonged period at the drilling site.* | *Medium Low (-)* | *Low (-)* |
| | | *Storage of hydrocarbons and chemicals, which may impact on groundwater as a result of spillages and uncontrolled release.* | *Medium Low (-)* | *Low (-)* |
| | | *The seepage of contaminated water in the slimes dams can also result in groundwater pollution.* | *Medium High (-)* | *Medium Low (-)* |
| | | *The prospecting operations will require the drilling of boreholes. The boreholes may result in the drawdown, which may affect the yield to the surrounding groundwater users. Material used for backfilling may leach pollutants that will result in the pollution of the surrounding groundwater regime. This may even spread beyond the backfilling site via plume migration.* | *Low (-)* | *Low (-)* |
| | *Surface Water and Hydrology* | *The drilling operations may result in the generation of surface water runoff contaminated with drilling muds and cuttings should spillages occur. The sedimentation and possible contamination with carbonaceous material will have negative impacts on the surrounding clean water environment. These will cause an increase in the turbidity and will decrease acidity of the water in the streams, which will affect the aquatic habitat, hence important habitats may be lost.* | *Medium Low (-)* | *Low (-)* |
| | | *Impact of the Removal and Alteration of Natural Water Courses on Catchment Response: The proposed shallow pits have not yet been determined; however, it will certainly cover a significant portion of the proposed project area. Inevitably, certain existing non perennial water courses that collect and convey surface water runoff to drainage lines and wetlands would be removed or altered.* | *Medium Low (-)* | *Low (-)* |
| | | *Positive Impact of Reduced Peak Runoff and Discharge Volumes on Water Courses: The proposed prospecting development would require construction of Prospecting and bulk sampling with pits and trenches; Ablution facility; Access roads; Diesel storage; Office site; Plant site; Slimes dam; Office Area; and Vehicle parking area. Being classified as "dirty," rain falling on this infrastructure would be captured and contained. Consequently, the quantum of surface water runoff would reduce.* | *Medium Low (+)* | *Medium Low (+)* |
| | | *Impact of Reduction in Mean Annual Runoff on Downstream Surface Water Resources* | *Medium Low (-)* | *Low (-)* |

| PHASE | ENVIRONMENTAL ASPECT | NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|
| | | *Impact of Increased Sediment Yield on Surface Water Quality: the erosion potential of the local soils, it is likely that the construction and operational phases of the proposed development would cause an increase in erosion. Thus, an increase in sediment deposition could be expected at the drainage lines and wetlands. To limit the environmental impact on faunal and floral communities, sediment yield must be reduced as far as possible. Sediment load is measured in terms of Total Suspended Solids (TSS), but through the effective design and deliberate implementation of BMP "treatment trains, its impact can be mitigated* | *Medium Low (-)* | *Low (-)* |
| | | *Impact of Increased Pollutant Load on Surface Water Quality* | *Medium Low (-)* | *Low (-)* |
| | *Aquatic Ecology and Wetlands* | *During the operational phase of the prospecting area rainfall is likely to filter through into the project waste, This water is likely to accumulate particles and pollutants that will pose a risk to the surrounding watercourses. Sediment that washes off the project site during periods of rainfall will also contribute to increased sedimentation in the aquatic environment. Erosion and sedimentation impacts are linked to alterations in hydrological regimes as a result of increased storm water flood peaks associated with increased impermeable surfaces and the concentration of flows. Increases in peak discharge may significantly increase stream power, increasing the risk of erosion (localised scouring and incision) and resultant sedimentation of watercourses. Local site factors such as soil erodibility, vegetation cover, gradient of local slopes and regional rainfall/runoff intensity will affect the probability and intensity of erosion impacts (Macfarlane et al., 2014).* | *Medium High (-)* | *Medium Low (-)* |
| | | *Pollution of water resources and soil Changes to the water quality will result in changes to the ecosystem structure and function as well as a potential loss of biodiversity. Water quality pollution leads to modification of the species composition where sensitive species are lost and organisms tolerant to environmental changes dominate the community structure. Any substances entering and polluting watercourses will directly impact downstream ecology through surface runoff during rainfall events, or subsurface water movement, particularly during the wetter summer months.* | *Medium High (-)* | *Medium Low (-)* |
| | | *Alien Invasive Species: There are alien invasive plant species currently present within the area. Any ground disturbance provides an opportunity for alien invasive plant species to spread and for new species to establish themselves in the areas. Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and "quality" of species), change nutrient cycling and productivity, and modify food webs (Zedler & Kercher, 2004). Such changes on the ecology of the riparian habitat have/will have a detrimental impact on its ability to maintain both floral and faunal biodiversity.* | *Medium High (-)* | *Medium Low (-)* |
| | *Biodiversity* | *Continued destruction of potential floral habitats for species of conservational concern as a result continual disturbance of soils leading to altered floral habitats, erosion, and sedimentation.* | *Low (-)* | *Low (-)* |
| | | *Impact on floral species of conservational concern as a result of an increased in alien species proliferation and ineffective rehabilitation of exposed areas* | *Low (-)* | *Low (-)* |
| | | *Loss of faunal habitat and ecological structure as a result of increased fires during operation and introduction of alien species, leading to transformation of the natural habitat* | *Low (-)* | *Low (-)* |

| PHASE | ENVIRONMENTAL ASPECT | NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|
| | Soils Land use and Land Capability | Topsoil removal, storage, and replacement during the excavation of the sumps will result. This will result in the disruption of the soils profile. | Low (-) | Low (-) |
| | | Soil contamination as a result of operational activities can be as a result of a number of activities (i.e. hazardous substance storage, incidental hydrocarbon leakages from construction vehicles). | Low (-) | Low (-) |
| | Air Quality | The prospecting operation will require vehicular movement which may result in Possible increase in dust generation, PM10 and PM2.5 as a result of stockpiling material, use of heavy machinery, and material movement. | Medium Low (-) | Low (-) |
| | | Increase in carbon emissions and ambient air pollutants (NO2 and SO2) as a result of movement of vehicles and operation of machinery/equipment. | Medium Low (-) | Low (-) |
| | Visual | The drill rigs and towers used during the drilling operations will be visible from the nearby Hotazel residents and properties. | Medium Low (-) | Low (-) |
| | | Visual impacts due to the structures erected on the formal structure which may be visible from access road | Medium Low (-) | Low (-) |
| | | The use of lighting around the project area and access roads will result in visual impacts | Medium Low (-) | Low (-) |
| | Heritage Resources | The drilling operation may result in the destruction of graves and any other heritage sites during operational phase of the project. | Low (-) | Low (-) |
| | Palaeontological Resources | Drilling of exploratory boreholes has potential to impact on palaeontological resources | Low (-) | Low (-) |
| | Noise | The use of vehicles and machinery during the construction phase may generate noise in the immediate vicinity | Medium Low (-) | Low (-) |
| | | Increase in ambient noise levels as a result of the drilling activities. | Medium Low (-) | Low (-) |
| | Traffic | Increase in traffic volumes as a result of pre-construction activities which may lead to an increase in traffic congestion on the public roads as well as the farm roads around the prospecting area. | Low (-) | Low (-) |
| | Climate | Emissions of Green House Gases as a result of the use of plant, heavy moving machinery, generators etc. | Low (-) | Low (-) |
| | Drilling and Vibrations | Impact of drilling ground vibration on houses, boreholes, and roads, resulting in possible damage to infrastructure | Low (-) | Low (-) |

| PHASE | ENVIRONMENTAL ASPECT | NATURE OF POTENTIAL IMPACT/RISK | SIGNIFICANCE BEFORE MITIGATION | SIGNIFICANCE AFTER MITIGATION |
|---|---|---|---|---|
| | | *Fly rock impact on houses, boreholes, and roads, resulting in possible damage to infrastructure;* | *Low (-)* | *Low (-)* |
| | *Waste Management* | *Potential water and soil pollution as a result of inappropriate waste management practices.* | *Low (-)* | *Low (-)* |
| ***CLOSURE AND DECOMMISSIONING*** | *Soils, Land Capability and Land Use* | *The removal of the campsite equipment and the rehabilitation of the drilling sites and associated access infrastructure will result in the affected soil and land use being restored. This will also result in the resumption of the use of the land since the infrastructure would have been removed.* | *N/A* | *N/A* |
| | *Land Use* | *Positive impacts will result due to the reduction in areas of disturbance and the return of land use of the affected areas and making available an area that was covered by the campsite and drilling sites.* | *N/A* | *N/A* |
| | *Soils and Vegetation* | *The use of vehicles/machinery during the rehabilitation of the exploration sites may result compaction of soils and in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination and destruction of the vegetation cover and soils.* | *Low (-)* | *Low (-)* |
| | *Surface water and aquatic ecosystem* | *During the decommissioning and closure phases equipment will be removed, stockpiled soils will be used for rehabilitation, remaining sumps will be backfilled, levelled, top soiled and the area re-seeded. During the process of rehabilitation, surface water runoff from the rehabilitation site may have elevated silt load, which may cause pollution of the nearby water environment.* | *Medium Low (-)* | *Low (-)* |
| | *Air Quality* | *Rehabilitation and removal of the prospecting sites and equipment will require vehicular movement. This will result in the generation of dust by movement of vehicles and due to blowing winds. Vehicles and machinery will also generated diesel or petrol fumes. Generated dust will migrate towards the predominant wind direction and may settle on surrounding properties including nearby vegetation.* | *Low (-)* | *Low (-)* |
| | *Noise* | *Noise will be generated during the removal of equipment and rehabilitation of the sites. This noise is not expected to exceed occupational noise limits and will be short lived.* | *Low (-)* | *Low (-)* |

## *Environmental Management Programme*

*An EMPr has been compiled as part of this EIA to ensure the mitigation of these impacts as far as practicable. It is anticipated that it will be possible to mitigate most of the environmental impacts to acceptable levels and the implementation will be monitored and audited to determine the effectiveness of the measures implemented. The EMPr is considered adequate to assist the project in striving towards the principles of the NEMA.*

*Temla 13 will be responsible for ensuring that all environmental obligations pertinent to the proposed project are met. The implementation of the EMPr and the meeting of the environmental objectives and targets is also the responsibility of Temla 13.*

## *Conclusion and Recommendation*

*Ndi Geological has undertaken the EIA and EMPr for the proposed prospecting by Temla 13 in accordance with the requirements of the NEMA and NEM: WA and other associated environmental legislation. This has included a comprehensive stakeholder engagement process which has sought to identify stakeholders, provide these parties with an adequate opportunity to participate in the project process and guide technical investigations that have taken place as part of the Impact assessment phase of this study. Specialist input has been included for all key environmental aspects that were identified during the scoping phase of the process.*

T*he positive and negative implications were assessed according to the construction, operational and decommissioning phases of the proposed project.*

*The proposed project will result in the prospering activities being undertaken for 5 years. These impacts were determined to have a positive impact, either directly or through the spinoffs generated by the development and operation of the proposed project and associated infrastructure.*

*In terms of local economy, there is the potential for multiple significant benefits to both local and regional businesses, as well as local employment opportunities. This would be highest, but temporary, during the construction phase, due to the requirement of contractors for services and materials. This has opportunities for both the formal and informal sectors, as smaller enterprises, including spaza shops, are likely to be established during the construction period to supply contractors and others with food and other amenities.*

*It is expected that Temla 13 will implement a policy allowing for preferential procurement for the local businesses and training of local Small, Medium, and Micro-sized Enterprises (SMME) on procurement and business management.*

*The project is expected to have a positive socio-economic benefit through short term employment of locals. Recruitment of labour will be guided by Temla 13's recruitment policies which are expected to promote the employment of local labour by Temla 13 as well as by any appointed contractors. Temla 13 will ensure that a transparent process of employment will be followed to limit opportunities for conflict that may arise.*

*The information that will be obtained from the prospecting to be done will be necessary to determine, should minerals be found, how and where the different minerals will be extracted and how much economically viable reserves are available within the proposed prospecting area. This will allow Temla 13 to enter into further studies towards a Mining Right.*

*Should minerals be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued. Temla 13 expects that substantial benefits from the project (should minerals be found) will accrue to the immediate project area, the sub-*

*region, and the province. This prospecting activity has a potential to decrease level of unemployment rate in proposed areas and surroundings. This prospecting activity will bring revenue into the city and the province which will in turn boost the economy of the country.*

*Various specialist studies were undertaken during the impact assessment phase of the proposed project, with the objective of identifying and weighing anticipated impacts and risks associated with the prospecting activities as well as in accordance with all relevant legislative requirements. All the identified impacts will be localised, short term and will have a medium and low significance. The significance of potential environmental impacts can be reduced to medium-low and low significance with implementation of mitigation measures and monitoring. Concurrent or progressive rehabilitation of disturbed areas is standard good practice and should be undertaken as it will reduce Temla's environmental liability and costs at closure as rehabilitation is included in the operational activities of the proposed project.*

*During the construction phase of the proposed project the majority of the negative impacts are associated with site clearance and vegetation removal activities. Topsoil loss should be limited by storing and protecting the topsoil to be used for rehabilitation purposes.*

*Vegetation clearance during construction will also result in loss of natural vegetation and disturbance to fauna on site. Site clearance and vegetation removal will also result in a loss in land capability. Natural vegetation removal is expected to have moderate significance impacts. The biodiversity assessment shows that there are no protected biodiversity species (flora and fauna) that require special protection. It is however expected that there will be loss of flora and fauna species due to various project activities. The implementation of mitigation measures contained in Section 13 result in avoidance and/or minimisation of biodiversity impacts. Alteration of the sub catchment and increased sedimentation of surface water resources which may also impact aquatic biota may also occur due to the proposed prospecting project. The implementation of mitigation measures such as commencing rehabilitation activities in tandem with or immediately following construction will however reduce the duration and significance of the impacts. There are a number of wetlands located on the project site. The institution of the 32m buffer (no-go zone) as stipulated by the specialist as well as implementation of mitigation measures to manage potential edge effects will result in the protection of wetlands on the site. The HIA found that there is a burial site located on the project property that may be affected by the proposed project. It is however expected that the implementation of mitigation measured including demarcating the burial site and associated 100m buffer as no-go zones will result in the protection of the burial site. The main negative implications associated with other general construction activities are nuisance noise, traffic, dust, and visual impacts.*

*Drilling ground vibrations may result in possible damage to infrastructure and private property. With the implementation of mitigation measures, these impacts can be reduced to be of minor negative significance.*

*Furthermore, the operation of surface infrastructure and drilling process may lead to deterioration of water quality (surface and groundwater). Local spillages of hydrocarbons and chemicals used during the pre-construction and construction phase which may leach to groundwater. There is potential for leakages, spillages, and seepage of groundwater contaminants from infrastructure including the slimes dams and waste rock dump area.*

*There are a number of watercourses that traverse the project area. Movement and use of vehicles and machinery as well as improper storage of hazardous substance may have Impacts on surface water and groundwater quality due to accidental spillages of hazardous substances. Contaminated dirty water runoff from the prospecting area to surrounding areas resulting in the impact on local surface water quality. A stormwater management plan will be compiled and implemented to ensure that water*

*resources are protected. The removal or containment of dirty water will result in the removal of MAR from the catchment, as this runoff will now be considered dirty water and will need to be contained.*

*Topsoil loss has been identified as a potential impact during the operational phase as a result of rainwater runoff and wind erosion from roads and soil stockpiles. In addition, alien vegetation may establish on the topsoil. This can be prevented by planting indigenous grass mixture, which will also assist in erosion reduction.*

*Ineffective rehabilitation of construction areas will lead to proliferation of alien invasive plant species. Similar to the construction phase, nuisance noise, dust and visual impacts are expected from general operation activities. All of these impacts can be mitigated.*

*The residual risk associated with the proposed project will largely relate to water management and rehabilitation following the operational phase. According to the hydrology specialist study, should the identified mitigation measures be implemented, the anticipated decrease in water quality attributable to increased pollutant load could be greatly reduced. Accordingly, the impact significance on drainage lines and wetlands downstream could be classified as minor during the construction and operation phases of the project, and negligible significance during the decommissioning phase. These monitoring requirements have been addressed in the EMPr.*

*Monitoring plans, which should be implemented throughout the life of the project, have also been provided to ensure that adverse impacts are reduced, and continuous improvements are made.*

*With the correct and effective mitigation and management measures, the proposed project is deemed feasible and desirable. Furthermore, the indirect impacts from the proposed development could cause negative impacts on the surrounding natural environment, unless this is also managed and monitored in order to address adverse impacts immediately. Rehabilitation must be implemented based on best practice principles and the DMR, DWS and DFFE should monitor activities* during the construction, operational and closure phases of the proposed project.

*An EMPr has been compiled as part of this EIA to ensure the mitigation of these impacts as far as practicable. It is anticipated that it will be possible to mitigate the environmental impacts to acceptable levels and the implementation will be monitored and audited to determine the effectiveness of the measures implemented. The EMPr is considered adequate to assist the project in striving towards the principles of the NEMA.*

*The project team believes that the EIA undertaken for the proposed prospecting project fulfils the process requirements of the NEMA and the NEM: WA. The EAP recommends that an EA/WML be issued by the DMR and that the construction and operation of the project should be conducted under duty of care and must be in accordance with the recommendations that were included in this EIA/EMPr Report as well as conditions that will be included in the EA/WML by the DMR.*

# YOUR COMMENT ON THE EIA/EMPr REPORT

This Draft EIA/EMPr Report will be available for comment for a period of 30 days from 23 June 2023 to 24 July 2023. Copies of the EIA/EMPr Report have been made available at the following public places for review

| Public Place | Locality | Telephone |
|---|---|---|
| Ndi Geological website | http://www.ndigeoservices.co.za/ | 053 842 0687 |

An electronic copy will also be available on CD on request from the stakeholder engagement officers. I&AP's are requested to provide comments and information on the following aspects of the proposed project:

1. Information on how I&AP's consider that the proposed activities will impact on them or their socio-economic conditions;
2. Written responses stating their suggestions to mitigate the anticipated impacts of each activity;
3. Information on current land uses and their location within the area under consideration;
4. Information on the location of environmental features on site to make proposals as to how and to what standard the impacts on site can be remedied; and
5. How to mitigate the potential impacts on their socio-economic conditions and to make proposals as to how the potential impacts on their infrastructure can be managed avoided or remedied.

**DUE DATE FOR COMMENT**

## 24 July 2023

**Please submit comments to the EAP:**

**Ndivhudzannyi Mofokeng**
Ndi Geological Consulting Services (Pty) Ltd
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# Disclaimer

The opinions expressed in this Report have been based on the information supplied to Ndi Geological Consulting Services (Pty) Ltd (Ndi Geological) by Temla 13 (Pty) Ltd (Temla 13). The opinions in this Report are provided in response to a specific request from Temla 13 to do so. Ndi Geological has exercised all due care in reviewing the supplied information. Whilst Ndi Geological has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. Ndi Geological Consulting Services (Pty) Ltd does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of Ndi Geological Consulting's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which Ndi Geological had no prior knowledge nor had the opportunity to evaluate.

# List of abbreviations

| | |
|---|---|
| AIS: | Alien Invasive Species |
| BAP: | Biodiversity Action Plan |
| CARA: | Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) |
| CBAs: | Critical Biodiversity Areas |
| CPIX: | Consumer Price Index |
| DBSA | Development Bank of Southern Africa |
| DEA: | Department of Environmental Affairs |
| DEAT: | Department of Environmental Affairs and Tourism |
| DEM: | Digital Elevation Model |
| DENC: | Department of Nature Conservation |
| DFFE: | Department of Forestry, Fisheries, and the Environment |
| DMR: | Department of Mineral Resources |
| DSR: | Draft Scoping Report |
| DWS: | Department of Water and Sanitation |
| EA: | Environmental Authorisation |
| EAP: | Environmental Assessment Practitioner |
| EAP: | Environmental Assessment Practitioner |
| EAPASA: | Environmental Assessment Practitioners Association of South Africa |
| EC: | Electrical Conductivity |
| ECO: | Environmental Control Officer |
| EHS: | Environmental Health and Safety |
| EIA: | Environmental Impact Assessment |
| EIS: | Ecological Sensitivity and Importance |
| EMF: | Environmental Management Framework |
| EMPr: | Environmental Management Programme |

| | |
|---|---|
| EMS: | Environmental Management System |
| ERP: | Environmental Response Plan |
| FAO: | Food and Agriculture Organisation |
| GDP: | Gross Domestic Product |
| GHG: | Green House Gas |
| GIS: | Geographic Information System |
| GNR: | Government Notice Regulation |
| HGM: | Hydrogeomorphic |
| HIA: | Heritage Impact Assessment |
| I&APs: | Interested and Affected Parties |
| IDP: | Integrated Development Plan |
| KOP: | Key Observational Points |
| LM: | Local Municipality |
| LUDS: | Land Use Decision Support |
| MAR: | Mean Annual Runoff |
| MHSA: | Mine Health Safety Act, 1996 (Act 29 of 1996) |
| MPRDA: | Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) |
| MSDS: | Material Safety Data Sheets |
| NCNCA: | Northern Cape Nature Conversation, 2009 (Act 9 of 2009) |
| NEM: AQA: | National Environmental Management Air Quality Act , 2004 (Act of 2004) |
| NEM: WA: | National Environmental Management: Waste Act, 2008 (Act 59 of 2008) |
| NEM:BA: | National Environmental Management: Biodiversity Act 2004 (Act 10 of 2004) |
| NEMA: | National Environmental Management Act (Act No. 107 of 1998) |
| NFA: | National Forestry Act, 1998 (Act 84 of 1998) |
| NHRA: | National Heritage Resources, 1999 (Act 25 of 1999) |
| NO: | Nitrogen Oxide |

| | |
|---|---|
| ONA: | Other Natural Areas |
| PAIA: | Promotion of Access to Information Act, 2000 (Act 2 of 2000) |
| PE: | Probability of Exceedance |
| PES: | Present Ecological Status |
| PIA: | Palaeontology impact Assessment |
| PM: | Particulate Matter |
| PoS: | Plan of Study |
| PR: | Prospecting Right |
| PRA: | Prospecting Right Application |
| PWP: | Prospecting Works Programme |
| RI: | Recurrence Interval |
| SAHRA: | South African Heritage Resources Agency |
| SAN: | South African National Standards |
| SANBI: | South African National Biodiversity Institute |
| SAPD: | South African Police Department |
| SCC: | Species of conservation Concern |
| SDF: | Spatial Development Framework |
| SMME: | Small, Medium, and Micro-sized Enterprises |
| SO: | Sulfur Oxides |
| SWMP | Stormwater Management Plan |
| TBSh: | Tropical shrubland |
| ToR: | Terms of Reference |
| TSS: | Total Suspended Solids |
| WMA: | Water Management Area |
| WML: | Waste Management Licence |
| WULA: | Water Use Licence Application |

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

# ENVIRONMENTAL IMPACT ASSESSMENT REPORT

# And

# ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

## FOR LISTED ACTIVITIES ASSOCIATED WITH THE PROPOSED PROSPECTING (WITH BULK SAMPLING) FOR ALLUVIAL DIAMONDS (DA), KIMBERLITIC DIAMONDS (DK), GRAVEL (GRAV), SAND GENERAL (QY) AND POTENTIAL ACCOMPANYING TRACE GOLD (AU) ORE ON A PORTION OF FARM MIER 585 IN THE DAWID KRUIPER LOCAL MUNICIPALITY , NORTHERN CAPE PROVINCE

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

| | |
|---|---|
| **NAME OF APPLICANT** | Temla 13 (Pty) Ltd |
| **TEL NO** | 082 458 9465 |
| **FAX NO:** | |
| **POSTAL ADDRESS** | 6213 End Street, Postmasburg, 8420, Northern Cape |
| **PHYSICAL ADDRESS** | 6213 End Street, Postmasburg, 8420, Northern Cape |
| **FILE REFERENCE NUMBER SAMRAD** | NC30/5/1/1/2/13169 PR |

## IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or Mining Right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation, or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable, or instructions or guidance provided by the competent authority to the submission of applications.

**It is therefore an instruction that** the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

**OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

The objective of the environmental impact assessment process is to, through a consultative process—

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the—-

(i) nature, significance, consequence, extent, duration, and probability of the impacts occurring to inform identified preferred alternatives; and

(ii) degree to which these impacts—

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources, and

(cc) can be avoided, managed, or mitigated;

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts; and identify residual risks that need to be managed and monitored._____

# 1 Project background

Temla 13 (Pty) Ltd (Temla 13) appointed Ndi Geological Consulting Services (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to conduct the Prospecting Right (PR) / Environmental Authorisation (EA) / Waste Management Licence (WML) application processes for the project located in the Dawid Kruiper Local Municipality, within the ZF Mgcawu District Municipality (previously known as Siyanda District Municipality), Northern Cape Province (DMR Reference: NC30/5/1/1/2/13169PR).

The proposed prospecting project, which includes bulk sampling, will cover an area of ±1 870.6 hectares and is located less than 1km to the east of Rietfontein in the Northern Cape Province.

Temla 13 requires a PR in terms of the Mineral and Petroleum Resources Development Act (Act No. 22 of 2002) (MPRDA). Before the PR will be granted, Temla 13 must undertake an EA and WML application process in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM: WA). The competent authority for the environmental authorisation process is the Northern Cape Department of Mineral Resources (DMR).

The Department of Forestry, Fisheries, and the Environment (DFFE) has identified the need for the alignment of EA/WML and has promulgated a single environmental management system under NEMA whereby the DMR has become the competent authority for the authorisation of mining-related projects under the NEMA Environmental Impact Assessment (EIA) Regulations. This will result in simultaneous decisions in terms of NEMA, the NEM:WA and other environmental management acts.

The proposed project triggers activities listed in terms of Listing Notices 1, 2 and 3 of the NEMA and will therefore require an EA from the DMR. In addition, the proposed project also triggers activities listed in Category B of Government Notice Regulation (GNR) 921 of the NEM: WA, which requires a WML from the DMR. Activities listed in Listing Notice 2 of the NEMA and Category B of GNR 921 of the NEM: WA require that a full Environmental Impact Assessment (EIA) (Scoping and Impact Assessment Phases) be conducted. An integrated application for an EA and WML will be conducted, and a full EIA (Scoping and Impact Assessment) process will be followed.

Before a mining operation for any of the minerals (Alluvial Diamonds (Da), Kimberlitic Diamonds (Dk), Gravel (Gravy), Sand General (Qy) and potential accompanying Trace Gold (Au) Ore can be planned and built, several tests and surveys must be conducted to ensure that the project is economically viable, technically feasible, and environmentally sound. Prospecting will consist of non-invasive (analytical desktop studies, geological mapping, and drill hole and bulk sampling layout planning), invasive (drilling and bulk sampling) activities.

The prospecting right will be required for five (5) years.

Most of the rehabilitation will be conducted in tandem with the prospecting activities. The final rehabilitation will be done once the prospecting activities have been completed at a site and before the drilling team leaves the site. A follow up visit will be required after the drilling team has rehabilitated the area to determine the success of the rehabilitation and assess whether any additional rehabilitation will be required. The specific requirements will be included in the rehabilitation plan during the impact assessment phase of the process.

The stakeholder engagement process, as part of the EA/WML process, is conducted in terms of NEMA (as amended) which provides clear guidelines for stakeholder engagement during an EIA. One of the general objectives of integrated environmental management set out in Section 23 (2) of NEMA is to ensure the "*adequate and appropriate opportunity for public participation in decisions that may affect the environment*". It is a process that is primarily aimed at affording stakeholders and Interested and Affected Parties (I&APs) the opportunity to gain an understanding of the project. In addition, the purpose of consultation with the landowners, affected parties and communities is to provide them with the necessary information about the proposed project so that they can make informed decisions as to whether and to which degree, the project will affect them. Before an independent Environmental Assessment Practitioner (EAP) submits a final report, they must have given registered I&APs access to, and an opportunity to comment on the report prior to the submission of the final report to the competent authority for approval. The registered I&APs were provided with an opportunity to review and comment on the draft Scoping Report for 30 days. The registered I&APs will be provided with an opportunity to review and comment on the draft Impact Assessment Report once the Scoping Report has been finalised and approved by the DMR.

The reports and documentation for the integrated EA/WML application process will be compiled and finalised for submission to the DMR for the EA/WML in terms of the NEMA for consideration and decision making. The DMR will consult with other government authorities as required in terms of Section 24(K) of the NEMA.

# 2 Purpose and context of this document

The project triggers activities listed in terms of Listing Notice 1, 2 and 3 of the NEMA (as amended) and will require an EA from the DMR. The proposed slimes dams will trigger activities listed in GNR 921 (Category B) NEM: WA and will therefore also require a WML from the DMR. An integrated application for an EA and WML will be conducted where a full EIA including Scoping and Impact Assessment will be followed as stipulated in GNR 326 of the NEMA and GNR921 of the NEM: WA.

An EIA is defined as the process of identifying, predicting, evaluating, and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made. The aim of the EIA is to prevent substantial damage to the environment. The objectives of this study are:

- To comply with the requirements of NEMA and NEM: WA and associated Regulations;
- Identify and assess the environmental (biophysical, socio-economic, and cultural) impacts of the construction, operation, and closure of the proposed project. The cumulative impacts of the proposed development will also be identified and evaluated;
- Identify and evaluate potential management and mitigation measures that will reduce the possible negative impacts of the proposed development and enhance the positive impacts;
- Compile monitoring, management, mitigation, and training needs in the Environmental Management Programme (EMPr); and
- Provide the decision-making authorities with sufficient and accurate information in order to make a sound decision on the proposed development and set conditions that must be adhered to.

## 2.1 Integrated Environmental Authorisation and Waste Management Licence Application Process

The first phase of the EA/WML application process was the scoping phase, which informed the impact assessment phase. The scoping phase provided I&APs an opportunity to provide the EAP with issues and concerns with respect to the proposed project in order to inform the technical studies that were evaluated in this EIA phase of the project.

The Scoping Report provided a guide to the EIA process and specialist studies by:

- Providing an overview of the legal requirements with regard to the proposed project, the proposed project description and anticipated environmental and social issues and impacts that were further investigated in this impact assessment phase; and
- Setting out the scope of the EIA process and the Terms of Reference (ToR) for specialist studies (where applicable) and outlining the approach and methodologies to be used in the EIA process, e.g. the proposed impact rating methodology. The Scoping Report was submitted to the DMR for approval.

The EIA Phase entails the following:

- Incorporating specialist findings into the Draft EIA/EMPr as per the approved Plan of Study (PoS) contained in the approved Scoping Report;

- Conducting a quantitative impact assessment and specialist studies;
- Compiling the EMPr; and
- Stakeholder Consultation

Stakeholder engagement is a key element of the environmental decision-making process, and stakeholder engagement formed part of the scoping phase and forms part of the impact assessment phase as described in Section 9.

Figure 2-1 provides an illustration of the proposed EIA process that is being followed.

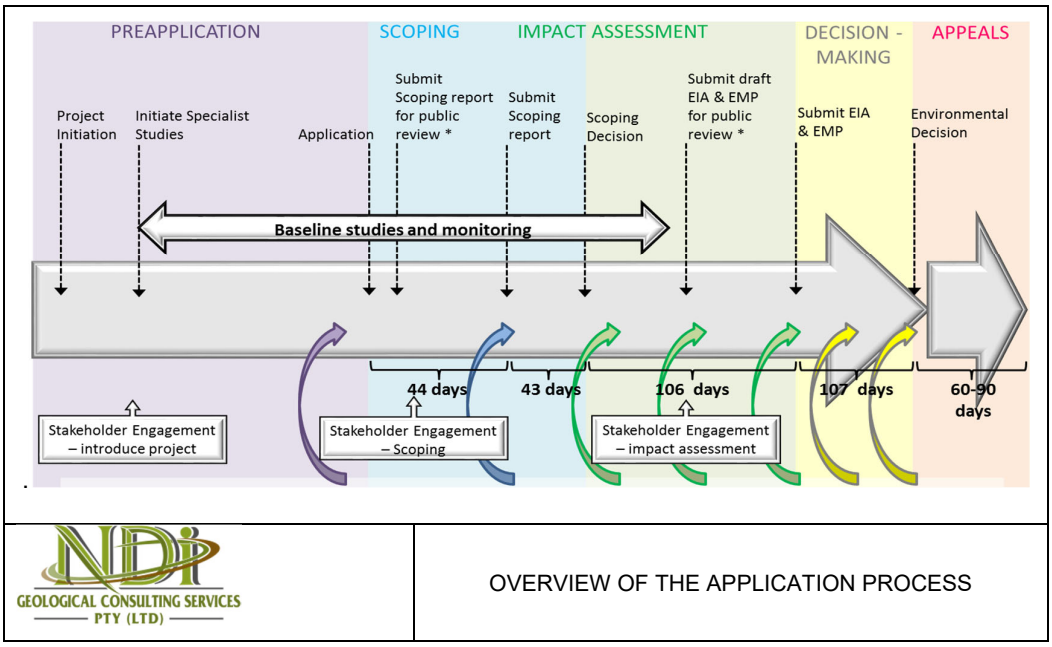



**Figure 2-1: Overview the Environmental Impact Assessment Process**

## 2.2 Report Index in Relation to the NEMA Regulations

Regulation 2, Appendix 3 of GNR 982 published in terms of NEMA stipulates the minimal requirements and issues that need to be addressed in the EIA. This report strives to address all these requirements as per regulations. Table 2-1 indicates the regulations that have been addressed and the section of the EIA where these requirements can be found.

**Table 2-1: Requirements of Appendix 3 of Regulation 2 of GNR 982**

| Section of the EIA Regulations, 2014 | Description of EIA Regulations Requirements for EIA | Section |
|---|---|---|
| Appendix 3 (a) | Details of –<br>the EAP who prepared the report;<br>and the expertise of the EAP, including a curriculum vitae. | Section 3 |
| Appendix 3 (b) | The location of the activity, including –<br>The 21-digit Surveyor General code of each cadastral land parcel;<br>Where available, the physical address and farm name;<br>Where the required information in items (i) and (ii) is not available, coordinates of the boundary of the property or properties. | Section 4 |

| Section of the EIA Regulations, 2014 | Description of EIA Regulations Requirements for EIA | Section |
|---|---|---|
| Appendix 3 (c) | A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is –<br>A linear activity, a description, and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or<br>On land where the property has not been defined, the coordinates within which the activity is to be undertaken. | Figure 5-1<br>Figure 5-2 |
| Appendix 3 (d) | A description of the scope of the proposed activity, including –<br>All listed and specified activities triggered;<br>A description of the activities to be undertaken, including associated structures and infrastructure. | Section 5 |
| Appendix 3 (e) | A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process. | Section 6 |
| Appendix 3 (f) | A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location. | Section 7 |
| Appendix 3 (g) | A motivation for the preferred development footprint within the approved site. | Section 8 |
| Appendix 3 (h) | A full description of the process followed to reach the proposed preferred activity, site, and location within the site, including- | |
| | Details of the development footprint alternatives considered; | Section 8 |
| | Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; | Section 9 |
| | A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; | Section 9.4 |
| | The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; | Section 10 |
| | The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which the impacts-<br>(aa) can be reversed;<br>(bb) may cause irreplaceable loss of resources; and<br>(cc) can be avoided, managed, or mitigated. | Section 13 |
| | The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; | Section 12 |
| | Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographic, physical, biological, social, economic, heritage and cultural aspects; | Section 13 |

| Section of the EIA Regulations, 2014 | Description of EIA Regulations Requirements for EIA | Section |
|---|---|---|
| | The possible mitigation measures that could be applied and level of residual risk; | Section 13 |
| | If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and; | Section 15 |
| | A concluding statement indicating the preferred alternative development location within the approved site. | Section 16 |
| Appendix 3 (i) | A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including-<br>a description of all environmental issues and risks that were identified during the environmental impact assessment process; and<br>an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures; | Section 17 |
| Appendix 3 (j) | An assessment of each identified potentially significant impact and risk, including-<br>cumulative impacts;<br>the nature, significance and consequences of the impact and risk;<br>the extent and duration of the impact and risk;<br>the probability of the impact and risk occurring;<br>the degree to which the impact and risk can be reversed;<br>the degree to which the impact and risk may cause irreplaceable loss of resources; and<br>the degree to which the impact and risk can be mitigated. | Section 13<br>Section 17.1 |
| Appendix 3 (k) | Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report. | Section 18 |
| Appendix 3 (l) | An environmental impact statement which contains-<br>i. a summary of the key findings of the environmental impact assessment;<br>ii. a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and<br>iii. a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives. | Section 19 |
| Appendix 3 (m) | Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation. | Section 20 |

| Section of the EIA Regulations, 2014 | Description of EIA Regulations Requirements for EIA | Section |
|---|---|---|
| Appendix 3 (n) | The final proposed alternatives which respond to the impact management measures,<br>avoidance, and mitigation measures identified through the assessment. | Section 21 |
| Appendix 3 (o) | Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation. | Section 22 |
| Appendix 3 (p) | A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed. | Section 23 |
| Appendix 3 (q) | A reasoned opinion as to whether the proposed activity should or should not be authorised,<br>and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation. | Section 24 |
| Appendix 3 (r) | Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised. | Section 25 |
| Appendix 3 (s) | An undertaking under oath or affirmation by the EAP in relation to:<br>i. the correctness of the information provided in the reports;<br>ii. the inclusion of comments and inputs from stakeholders and I&APs;<br>iii. the inclusion of inputs and recommendations from the specialist reports where relevant; and<br>iv. any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties. | Section 26 |
| Appendix 3 (t) | Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts. | Section 27 |
| Appendix 3 (u) | An indication of any deviation from the approved scoping report, including the Plan of study,<br>including-<br>v. any deviation from the methodology used in determining the significance of potential;<br>vi. environmental impacts and risks; and<br>vii. a motivation for the deviation. | Section 28 |
| Appendix 3(v) | Any specific information that may be required by the competent authority. | Section 29 |
| Appendix 3(w) | Any other matter in terms of Section 24(4)(a) and (b) of the NEMA. | Section 30 |

# 3 Contact Person and Correspondence

Ndi Geological Consulting Services (Pty) Ltd (Ndi Geological) has been appointed by Temla 13 as the EAP to undertake the necessary environmental authorisation process and associated stakeholder engagement process to meet the requirements of NEMA and NEM: WA.

## 3.1 Details of EAP who prepared the report

The EAP involved in the compilation of this Environmental Impact Assessment and Environmental Management Programme Report (EIA/EMPr Report) and contact details are provided in Table 3-1.

**Table 3-1: EAP Contact Details**

| EAP Name | Contact Number | Fax Number | Email Address |
|---|---|---|---|
| Ndivhudzannyi Mofokeng | 082 760 8420/<br>053 842 0687 | 086 538 1069 | atshidzaho@gmail.com<br>ndi@ndigeoservices.co.za |

## 3.2 Expertise of the EAP

### 3.2.1 Qualifications of the EAP

The qualifications of the EAP are provided for in Table 3-2 below, and copies of the qualifications are provided in Appendix B.

**Table 3-2: EAP Qualifications**

| EAP Name | Qualifications | Professional registration | Years' Experience |
|---|---|---|---|
| Ndivhudzannyi Mofokeng | BSc (Hons) Earth Sciences in Mining and Environmental Geology | EAPASA Reg Number 2020/1554<br>GSSA Prof Reg | More than 13 |

### 3.2.2 Summary of EAPs past experience

The EAP, Mrs Ndivhudzannyi Mofokeng is a registered EAP (Environmental Assessment Practitioners Association of South Africa (EAPASA) Reg Number 2020/1554) with a BSc (Hons) Earth Sciences, majoring in Mining and Environmental Geology. She is a self-motivated and hardworking Geologist with more than 14 years of experience in environmental, mining exploration, open cast work and consulting in the mining industry. She has proven leadership skills from supervising exploration rigs (Reverse Circulation and Percussion Drilling). Proven field experience in exploration, i.e. mapping, borehole logging, borehole sampling, sample preparation for laboratory analysis, supervisory duties in the field. Her responsibilities involve but are not limited to managing all Environmental matters: EIA and Environmental Management Programme, Environmental Authorizations, Environmental Auditing & Risk Assessment, Mine Closure & Rehabilitation, and conducting & reviewing Environmental specialists' studies. Ndivhudzannyi also has experience in writing geological reports, including Prospecting Work Programmes and Mining Work Programmes Environmental Management Plans, handling

Department of Mineral Resources and Energy documents in general like the submission of Mining & Prospecting Right Applications (PRAs) and Renewals.

Please refer to Appendix 2 for a copy of the EAP's Curriculum Vitae and Professional Registration Certificate.

# 4 Project Location

## 4.1 Property Description

The proposed prospecting will be undertaken on a portion of Farm Mier 585, located less than 1km to the east of Rietfontein in the Dawid Kruiper Local Municipality, ZF Mgcawu District Municipality (previously known as Siyanda District Municipality), Northern Cape Province. The footprint of the area is approximately ±1 870.6 ha. The description of the affected properties is provided in Table 4-1 and a map showing the affected property is provided in Figure 4-1.

**Table 4-1: Description of Properties affected by the Temla 13 PRA**

| | |
|---|---|
| **Farm Name:** | Portion of Farm Mier 585 |
| **Application area (Ha)** | 1 870.6 ha |
| **Magisterial district:** | ZF Mgcawu District Municipality (previously known as Siyanda District Municipality |
| **Distance and direction from nearest town** | Less than 1km to the east of Rietfontein |
| **21-digit Surveyor General Code for each farm portion** | C02800000000058500000 |

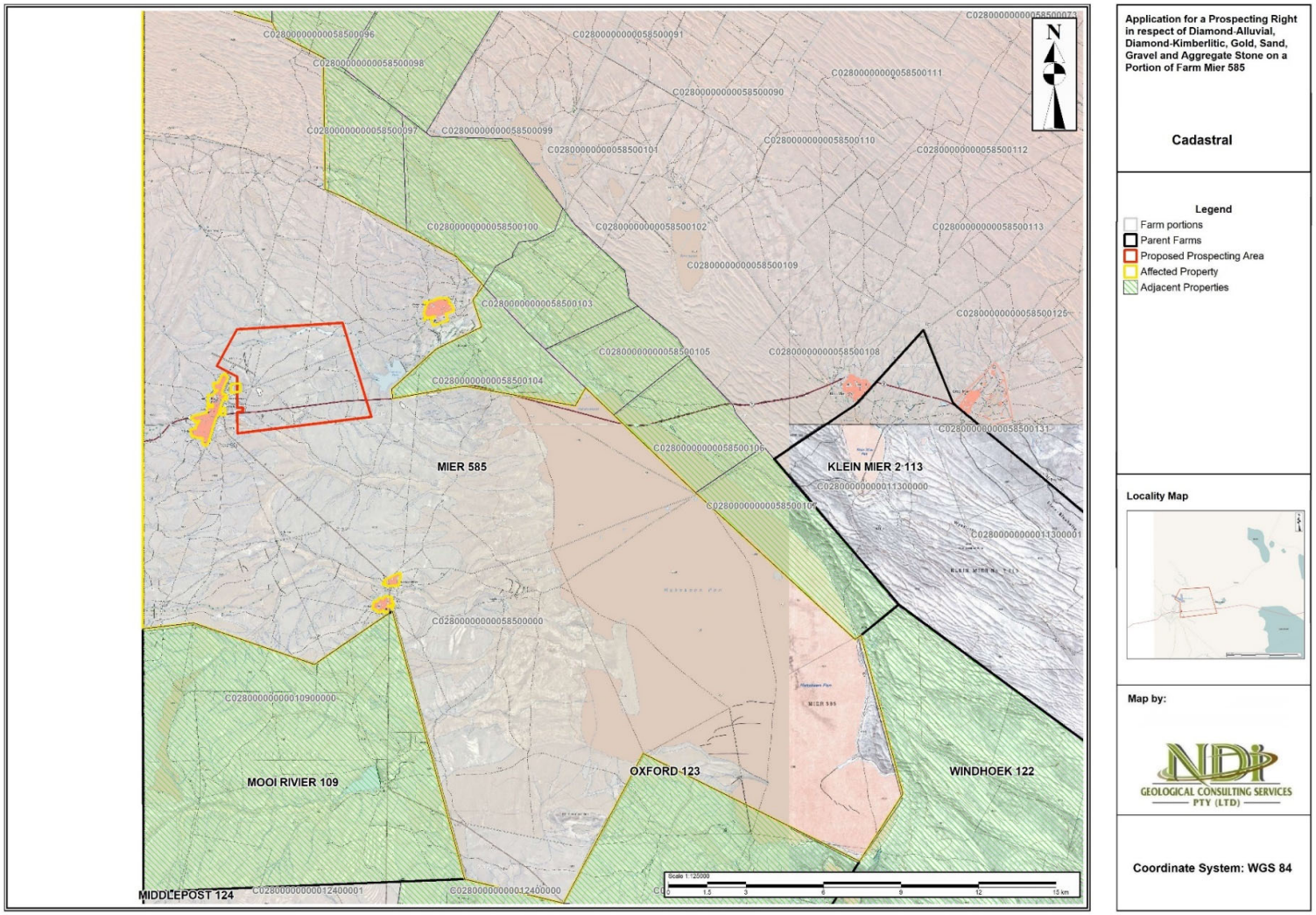



**Figure 4-1: Cadastral Map**

## 4.2 Locality map

The proposed prospecting will be undertaken on a portion of Farm Mier 585 located less than 1km to the east of Rietfontein in the Northern Cape Province of South Africa (Figure 4-2).

A copy of the locality map is provided in Appendix 3.

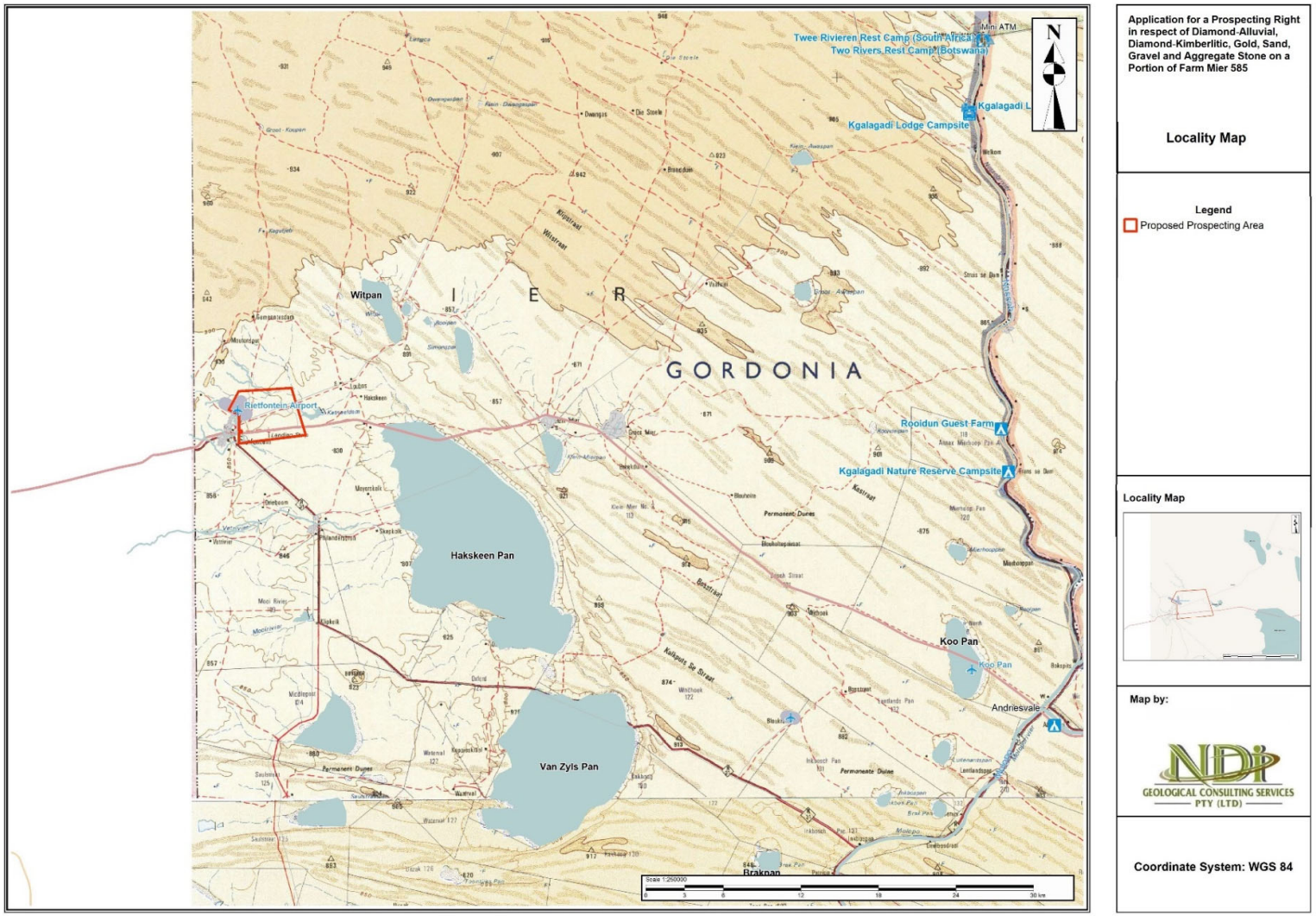



**Figure 4-2: Locality Map**

# 5 Project description

Prospecting activities carried out for this project will be both non-invasive and invasive. The non-invasive activities will be restricted to a desktop study (literature review) and geological mapping. The aim of non-invasive activities is to better understand the nature of the deposit being prospected for. Thorough understanding of the deposit ensures the use of correct prospecting techniques for the deposit. Non-invasive techniques will also entail interpretation of available remotely sensed data for the prospecting area. Bulk sampling is an invasive prospecting activity that will be utilized for this project.

A standardized phased approach to all prospecting activities will be implemented. Each activity will be undertaken on a scheduled timeline, with some activities being run concurrently, while others will run sequentially.

Specific milestones will be determined and used as a basis for decisions regarding further activities related to the Prospecting Works Programme (PWP). The total duration of the prospecting and evaluation activities is planned for five (5) years.

## 5.1 Prospecting Activities

### 5.1.1 Non-Invasive Activities

Non-invasive activities which form phase 1 of the process will include:

- Remote data analysis (satellite imagery, airborne geophysical data);
- Geophysical ground survey (if recommended)
- Geological mapping

### 5.1.2 Invasive Activities

Rooikoppie gravels will be prospected with shallow pits and trenches. Prospecting and sampling are planned over 500 x 500 m grid for Phase 2. Every excavation will be documented to design model of the gravel body.

Prospecting/bulk sampling unit for alluvial will comprise 1 x 16’ rotary wetlands with relevant earthmoving equipment (1 excavator, 1 front-end loader, 1 dump truck) and standard auxiliary equipment, e.g. generator, pumps, sorting house, campsite, etc.

Modern Bourevestnik or similar type concentrator will be also tested. Accompanying alluvial gold will be extracted using shallow sluice boxes at initial stages. If viable grades would be verified, more sophisticated concentrating equipment will be tested.

Building sand and gravel will be extracted utilising a size classifying module. Provisional layout of trenches/pits is presented on Figure 5-1. This will be adjusted depending on the outcomes of the practical tests. In a case of deviation from preliminary plan over 10-15%, both in terms of spatial distribution and ultimate depth of the pits, amended program and EMP will be duly submitted to DMR for approval and endorsement.

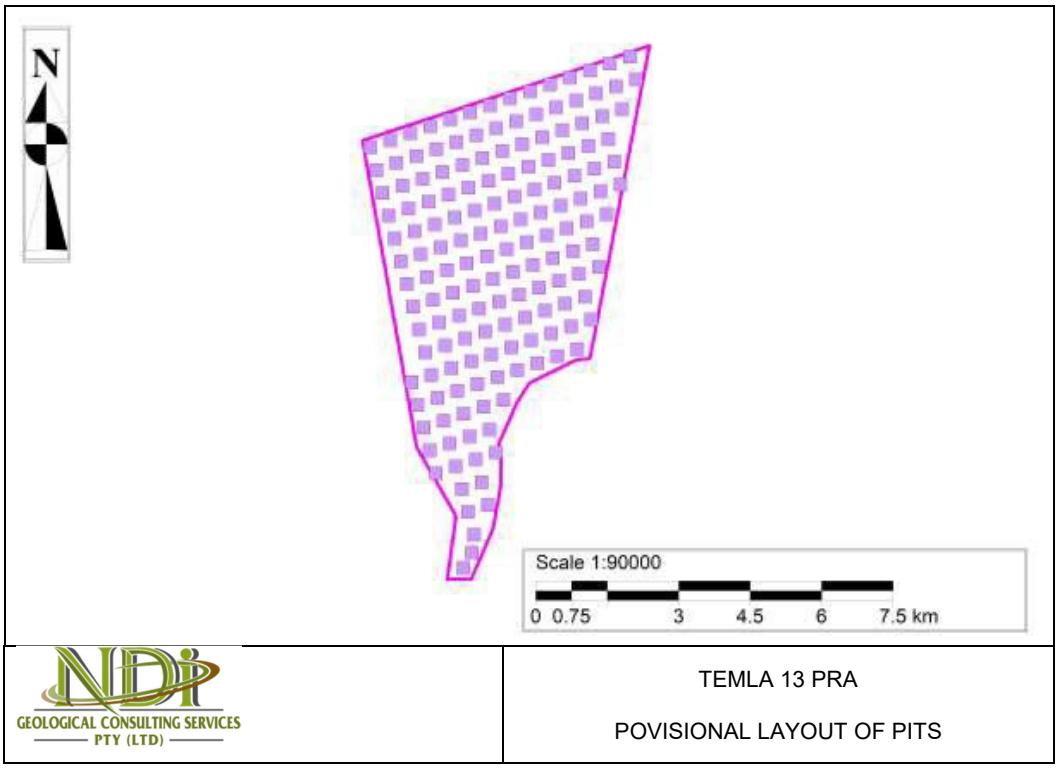



**Figure 5-1: Provisional layout of pits over 500 x 500 m grid**

The preliminary project timeframes are provided in Table 5-1.

**Table 5-1: Project Activities and Timeframes**

| Phase | Activity | Skill(s) required | Planned Timeframe (months) | Outcome | Outcome Timeframe | Qualified Signatory |
|---|---|---|---|---|---|---|
| Phase 1 | Desktop study of geophysical and geological data sourced from the Council of GeoSciences | Geologist, Geophysist | 1 | Adjusted bulk sampling pits/trenches layout, targets for ground geophysical survey | Month 2 | Geologist, Geophysist |
| Phase 2 | Invasive: trenching and bulk sampling of alluvial diamond targets | Mining Contractor | 24 months | Evaluation of diamond grade and quality | Month 24 | Geologist, Miner |
| | Non-invasive: geophysical survey (subject to recommendations of previous phase) | Geophysical team (contracted) | 2 months | Verification of probable kimberlite target(s), alluvial palaeochannel outline | Month 6 | Geophysist |
| | Non-invasive: geological mapping of outcrops and pits/trenches | Geologist | On-going | Detailed geological map | N/A | Geologist |
| | Invasive: trenching and bulk sampling of kimberlite targets (if found) | Mining Contractor, External Plant | 4.0 | Evaluation of diamond grade and quality | Month 25 | Geologist, Plant Manager |
| Phase 3 | Invasive: trenching and bulk sampling of alluvial diamond targets continued | Mining Contractor | 24 | Evaluation of diamond grade and quality | Month 48 | Geologist, Miner |
| | Non-invasive: geological mapping of pits/trenches | Geologist | 24 | Detailed geological map | N/A | Geologist |
| | Invasive: trenching and bulk sampling of kimberlite target (if confirmed) | Mining Contractor, External Plant | 2 | Evaluation of diamond grade and quality | Month 48 | Geologist, Plant Manager |
| Phase 4 | 3D mapping of results | GIS technician | 2 | Ore body(ies) model | Month 56 | Geologist |
| | Invasive: trenching and bulk sampling of alluvial diamond targets | Miner, geologist | On-going | Evaluation of diamond grade and quality | On-going | Miner, Geologist |

| Phase | Activity | Skill(s) required | Planned Timeframe (months) | Outcome | Outcome Timeframe | Qualified Signatory |
|---|---|---|---|---|---|---|
| | Choice of sections for upgrading for Mining Right | Geologist, Mining Engineer, Miner | 2<br><br>2 | Application for Mining Right, Mine Closure Certificate for released blocks,<br><br>Application for Mining Right, Mine Closure Certificate for released blocks, Deposit(s) model, recommendation on upgrade for a Mining Right or additional prospecting/bulk sampling | Month 58<br>Month 58<br><br>Month 60 | Geologist, Mining<br><br>Engineer, Miner<br>Geologist, Mining Engineer, Miner<br>Geologist |
| | Final rehabilitation of blocks to be released | Miner | | | | |
| | Final report | Geologist | 2<br><br>2 | Application for Mining Right, Mine establishment. Closure Certificate for released blocks, Deposit(s) model, recommendation on upgrade for a Mining Right or additional prospecting/bulk sampling | Month 58<br><br>Month 60 | Geologist, Mining Engineer, Miner<br>Geologist |

## 5.2 Pre-Feasibility Study

The pre-feasibility study will entail:

- Geological model of the area;
- Adjustment of the above model will be on-going process with prospecting/sampling results input, combined with detailed geological mapping;
- 3D modelling of identified ore body (bodies) shall determine potential ore resource;
- Mineralogical and metallurgical studies shall provide preliminary estimate of the overall viability of the potential mining project to follow the prospecting stage;
- In the case of positive outcome of (3) and (4) above, financial model will be developed.

## 5.3 Listed and specified activities

Section 24 of the NEMA requires that listed activities, which may potentially affect the environment negatively, must obtain an EA from a relevant authority before the activities may commence. Such activities are listed under the EIA Regulations (2014) which has been amended in 2017 and 2021 and consist of:

- EIA Process (Government Notice Regulation (GNR) 982) as amended by GNR326;
- Listing Notice 1 GNR 983 (as amended by GNR327) – Basic Assessment process,
- Listing Notice 2 GNR 984 (as amended by GNR325) – Scoping and EIA process;
- Listing Notice 3 GNR 985 (as amended by GNR324) – Activities in specific identified geographical areas only (requires a Basic Assessment process).

The purpose of these regulations is to avoid negative impacts on the environment, and where these cannot be avoided, ensure the mitigation and management of the impacts to acceptable levels, while optimising positive environmental impacts.

The proposed prospecting project activity triggers activities listed in NEMA Listing Notices 1, 2 and 3. In addition, the proposed project triggers activities listed in the GNR921 of the NEM:WA, which provides at list of activities that require a WML from the DMR. Due to the Integrated Environmental Process which the proposed Temla 13 Prospecting Project will follow, all relevant activities which require authorisation in terms of NEMA and NEM: WA have been included in Table 5-2.

The map below shows the plan contemplated in Regulation 2(2) of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA), depicting the land to which application relates. The map also denotes the directly affected farms and the boundary coordinates of the application area.

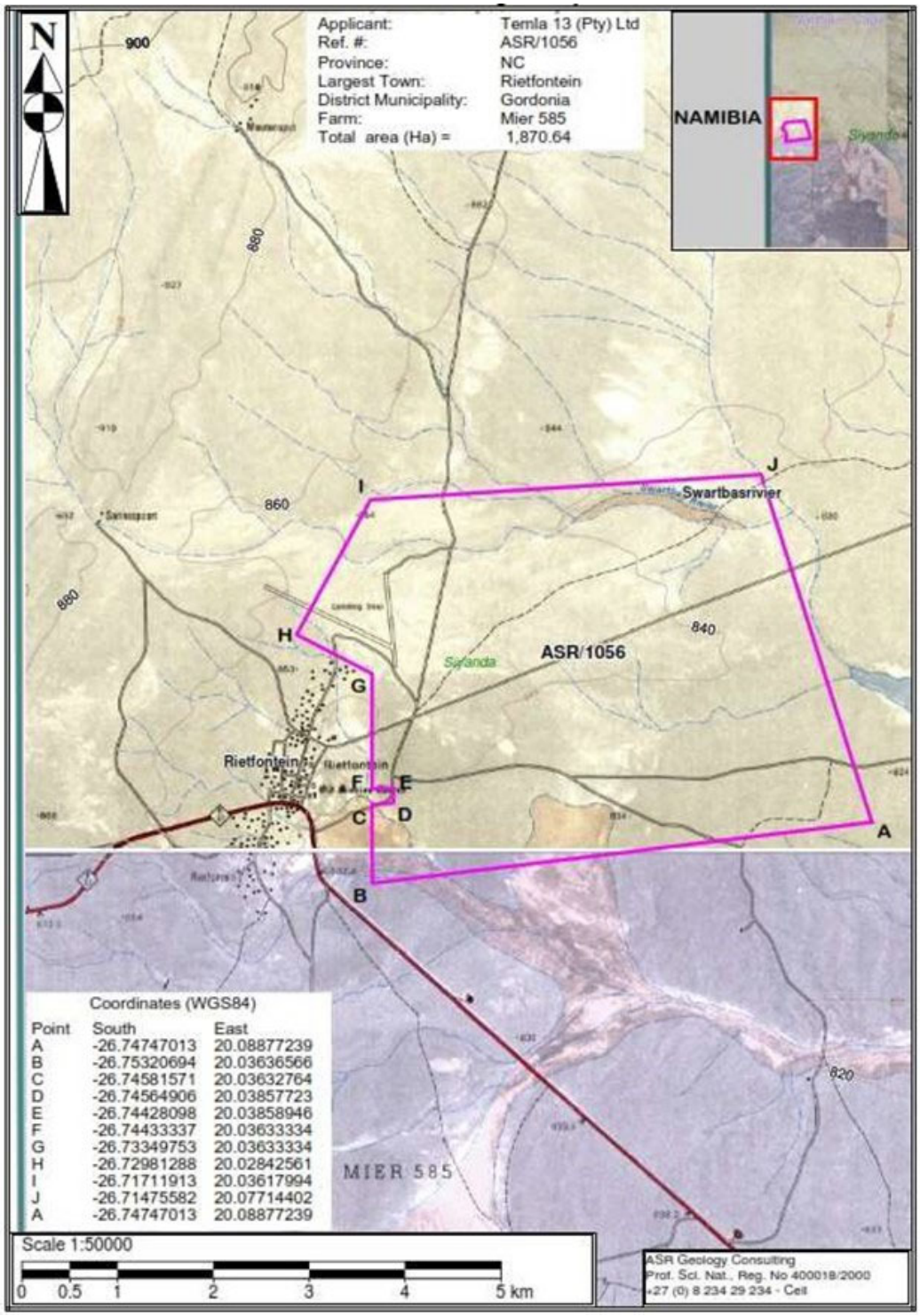



**Figure 5-2: Prospecting Right Application Area**

**Table 5-2: Applicable Activities**

| NAME OF ACTIVITY | Aerial extent of the Activity Ha or m² | LISTED ACTIVITY | APPLICABLE LISTING NOTICE | WASTE MANAGEMENT AUTHORISATION |
|---|---|---|---|---|
| **Activity 17 of NEMA Listing Notice 2**<br><br>**"Any** activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act,2002(Act 28 of 200) including:<br><br>(a) Infrastructure, structures, and earthworks, directly related to the extraction of a mineral resource; or<br>(b) Including activities for which exemption has been issued in terms of section 106 of the Mineral and Petroleum Resource Development Act,2002 (Act No.28 of 2002) the primary processing of a mineral resource including mining, -, concentration, crushing, streaming, or washing: but excluding the secondary processing of a mineral resource, including the mining, - or gasification of the mineral resource in<br>which case activity 6 in the notice applies | 1180 ha | x | GNR325 | |
| **Activity 24(ii) NEMA Listing Notice 1**<br><br>A road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres | N/A | | GNR 327 | |
| **Activity 56(ii) of NEMA Listing Notice 1**<br><br>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometer.<br><br>(i) where the existing reserve is wider than 13,5 meters; or<br>(ii) where no reserve exists, where the existing road is wider than 8 meters;<br>excluding where widening or lengthening occur inside urban areas. | N/A | | GNR327 | |

| NAME OF ACTIVITY | Aerial extent of the Activity Ha or m² | LISTED ACTIVITY | APPLICABLE LISTING NOTICE | WASTE MANAGEMENT AUTHORISATION |
|---|---|---|---|---|
| **Activity 15 of NEMA Listing Notice 2**<br><br>"The clearing of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-<br><br>(I) The undertaking of a linear activity; or<br>(ii) Maintenance purpose with a maintenance management plan | A total area of ~ 22.5 Ha will be physically disturbed where the prospecting pits will be excavated | X | GNR 325 | |
| **Activity 10 of NEMA** Listing **Notice 3:**<br><br>"The development of facility or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic meters." | N/A | | GNR 324 | |
| **Activity 9 of Category A under the National** Environmental **Management: Waste Act 59 of 2008** | N/A | | GNR 633 | |
| Activity 15 of Category A under the National Environmental Management Waste Act 59 of 2008<br><br>The continuous establishment and reclamation of temporary stockpiles resulting from activity which requires a mining right | 0.5 Ha at a time as maximum due to ongoing back filling | | GNR 633 | X |
| **Other Activity (associated infrastructure not considered to be listed activity)**<br><br>Temporary Workshop Facilities, Storage facilities and recovery plant site | 3000 m² | | Not listed | |
| Topsoil Stockpiles | 0.2 Ha at a time | | | |

# 6 Policy and legislative context

Table 6-1 lists the applicable legislation, policies and guidelines identified as relevant to the proposed project. In addition, a description of how the proposed activity complies with and responds to the legislation and policy context, is provided. This list is not exhaustive but rather represents an indication of the most applicable pieces of legislation relevant to the project.

**Table 6-1: Policy and Legislative Context of Proposed Project**

| Legislation | Description and Relevance | Authority |
|---|---|---|
| Constitution of the Republic of South Africa, (No. 108 of 1996) | Chapter 2 – bill of rights<br>Section 24 – Environmental Rights<br>The proposed activities shall be conducted in such a manner that significant environmental impacts are avoided, where significant impacts cannot all together avoided be minimised and mitigated in order to protect the environmental rights of South Africans | N/A |
| Promotion of Access to Information Act, 2000 (Act 2 of 2000) (PAIA) | The Promotion of Access to Information Act (Act No. 2 of 2000) (PAIA) recognises that everyone has a right of access to any information held by the state and by another person when that information is required to exercise or protect any right. The purpose of the Act is to promote transparency and accountability in public and private bodies and to promote a society in which people have access to information that enables them to exercise and protect their right.<br>The EIA/EMPr process to be undertaken in terms of the NEM: WA, NEMA and where required, the NWA, where the associated stakeholder consultation process will be aligned with the PAIA in the sense that all I&APs will be given an opportunity to register as an I&AP prior to the initiation of the project and all registered stakeholders will in turn be provided a fair opportunity to review and comment on any reports submitted to the competent authorities for decision making. | N/A |
| Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) | The Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) makes provision for equitable access to and sustainable development of South Africa's mineral resources. The MPRDA requires that the environmental management principles set out in NEMA shall apply to all mining operations and serves as a guideline for the interpretation, administration, and implementation of the environmental requirements of NEMA.<br>The MPRDA requires that a reconnaissance permission, prospecting right, mining right, mining permit, retention permit, technical corporation permit, reconnaissance permit, exploration right, production right, prospecting work programme; exploration work programme, production work programme, mining work programme, environmental management programme, or an environmental authorization issued in terms of the National Environmental Management Act, 1998, as the case may be, may not be amended or varied (including by extension of the area covered by it or by the addition of minerals or a | Department of Mineral Resources, Northern Cape Province |

| Legislation | Description and Relevance | Authority |
|---|---|---|
| | share or shares or seams, mineralized bodies, or strata, which are not at the time the subject thereof) without the written consent of the Minister.<br><br>Section 22 of the MPRDA as amended by Section 18 of Act 49 of 2008<br><br>The proposed project requires a Prospecting Right from the DMR. | |
| National Environmental Management Act, 1998 (Ac 107 of 1998) (NEMA) | Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment)<br><br>Section 28 – Duty of care and remediation of environmental damage<br><br>Environmental management principles will be incorporated into the EIA and EMPr, which the applicant will be required to comply with to ensure that negative impacts on the environment are avoided or kept to a minimum and that positive impacts are enhanced. | |
| NEMA and the EIA Regulations 2014 (Government Notice (GN) 984), as amended | The EIA Regulations (GNR 982) were promulgated in terms of Sections 24 of the NEMA, to manage the process, methodologies, and requirements for the undertaking of an EIA. The GNR 982 stipulates that the applicant for activities listed under GNR 983, 984 or 985 must appoint an independent EAP to manage the EIA process. Listed Activities are activities identified in terms of Section 24 of the NEMA which are likely to have a detrimental impact on the environment, and which may not commence without an EA from the Competent Authority (CA). EA required for Listed Activities is subject to the completion of either a Basic Assessment (BA) process or full Scoping and Environmental Impact Assessment (S&EIA) with applicable timeframes associated with each process. The EA must be obtained prior to the commencement of those listed activities.<br><br>The project triggers activities listed in Listing Notices 1 and 2 and will require an EA from the DMR. According to GNR 326 of the NEMA, activities listed in Listing Notice 2 require that a full S&EIA be undertaken. The applicable listed activities that will be triggered by the project is provided in Table 5-2. | |
| Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series, Guideline 5: Assessment of the EIA Regulations, 2012 (Government Gazette 805) | Environmental impacts will be generated primarily in the construction phase of this project with associated operational phase impacts. These will be assessed as part of the EIA process. | |

| Legislation | Description and Relevance | Authority |
|---|---|---|
| Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004 | A full EIA (scoping and impact assessment) is required for the proposed project as activities are triggered under Listing Notice 2. | |
| Review in Environmental Impact Assessment, Integrated Environmental Management, Information Series 13, Department of Environmental Affairs and Tourism (DEAT), Pretoria. | | |
| DEA Integrated Environmental Management Guideline Series, Guideline 7: Public Participation in the Environmental Impact Assessment Process, 2012 (Government Gazette 807) | Public participation is a requirement of the Scoping/EIA Process and will be conducted for the proposed project as stipulated in Chapter 6 of the NEMA. | |
| National Water Act, 1998 (Act 36 of 1998) (NWA) | There are watercourses and drainage lines located where drilling and infrastructure will be located, a Section 21 (c&) IWUL will be required.<br>**21 (c) & (i):**<br>Impeding, diverting, and altering the flow of water in a watercourse.<br>Altering the bed, banks, course, or characteristics of a watercourse.<br>All activities taking place within 100 m of a watercourse and/or within 500m of a wetland will be licensed under Section 21 c and i | Department of Water and Sanitation (DWS), Northern Cape |
| National Environmental Management Waste Act, 2008 (Act 59 of 2008) (NEM: WA) | It is expected that activities listed in GNR921 (Category B) will be triggered by the proposed Temla 13 Prospecting project and will require a waste management licence. Table 5-2 provides a list of GNR921 activities triggered by the project. | DMR and DWS, Northern Cape through the integrated application process |

| Legislation | Description and Relevance | Authority |
|---|---|---|
| National Environmental Management Air Quality Act , 2004 (Act of 2004) (NEM: AQA) | Air quality management<br>Section 32 – Dust control.<br>Section 34 – Noise control.<br>Section 35 – Control of offensive odours.<br>The principles of the NEM: AQA, focusing on minimisation of pollutant emissions has been taken cognisance of in the development of the EMPr. The impact assessment undertaken included the identification of potential air quality impacts that may result from the proposed project. Mitigation measures have been identified and included in Section 13 of this report. These management measures have been incorporated into the project EMPr and an air quality monitoring programme has also been compiled and incorporated into the EMPr. | Department of Environmental Affairs and ZF Mgcawu District Municipality (previously known as Siyanda District Municipality) |
| The National Forestry Act, 1998 (Act 84 of 1998) (NFA) | The NFA protects against the cutting, disturbance, damage, destruction, or removal of protected trees.<br>Impacts on biodiversity were investigated by a specialist and the findings from the assessment have been incorporated into this EIR. This included an assessment of the significance of biodiversity impacts and identification of mitigation measures that have been included in the project EMPr. No protected trees were identified during the assessment and therefore, no permits for the removal and/or relocation of the trees will be required. | Department of Agriculture, Forestry and Fisheries (DAFF) |
| The National Environmental Management: Biodiversity Act 2004 (Act 10 of 2004) (NEM:BA) | The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA) provides for the management and conservation of South Africa's biodiversity within the framework of NEMA, as well as the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources. The Act provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered, endangered, vulnerable, or protected<br>During the EIA process, biodiversity hotspots and bioregions have been investigated to determine the potential impacts that the project may have on the receiving environment. The management and control of alien invasive species on the impacted areas during all the phases of the project will be governed by the NEM: BA as stipulated in this EIR and EMPr. The NEM: BA ensures that provision is made by the site developer to remove any alien species, which have been introduced to the site or are | Department of Environmental Affairs |

| Legislation | Description and Relevance | Authority |
|---|---|---|
| | present on the site. The implementation of mitigation measures identified will ensure that alien invasive plant species are controlled and managed. | |
| Northern Cape Nature Conversation, 2009 (Act 9 of 2009) (NCNCA) | This Act provides sustainable utilization of wild animals, aquatic biota, and plants to provide for them implementation of the convention on international trade in endangered species of wild fauna and flora. The Act provides for offenses and penalties of contravention Act, further provide for the appointment nature conservator to implement the provision of the Act. It also provides the issuing of the permits and other authorisations and provides matters connected therewith.<br>No species protected in terms of the NCNCA were identified during the biodiversity specialist studies. | Northern Cape Department of Nature Conservation (DENC) |
| Mine Health Safety Act, 1996 (Act 29 of 1996) (MHSA) | The Mine Health and Safety Act (Act No. 29 of 1996) (MHSA) aims to provide for protection of the health and safety of all employees and other personnel at the mines of South Africa.<br>Temla 13 will be required to ensure that employees, contractors, sub-contractors and visiting personnel, adhere to this Act and subsequent amendment regulations on site. | Department of Mineral Resources (Northern Cape) |
| Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA) | Control measures for erosion<br>Control measures for alien and invasive plant species<br>The EMPr developed for the project includes measures to control and manage alien invasive plant species. | Department of Agriculture Forestry and Fisheries |
| National Heritage Resources, 1999 (Act 25 of 1999) (NHRA) | Heritage Permit for structures 60 years or older.<br>A Phase 1 Heritage Impact Assessment (HIA) was undertaken by a specialist. The assessment included an assessment of the significance of heritage impacts and identification of mitigation measures that have been included in the EMPr. The study identified a burial site that is located on the project property. A 100m buffer zone around the site was demarcated as the no-go area. No archaeological sites of significance were identified within the proposed prospecting site. However, should any resources be uncovered during the implementation of the proposed project, the chance find protocol developed by the HIA specialist will be implemented. | Northern Cape Heritage Resource Authority |

| Legislation | Description and Relevance | Authority |
|---|---|---|
| Restitution of Land Rights Act, 1994 (Act No. 22 of 1994), as amended in 2014. | Land Claims.<br>There are no land claims associated with the affected properties. | Department of Rural Development and Land Reform |

## 6.1 Municipal Plans and Policies: Dawid Kruiper Integrated Development Plan

According to the Integrated Development Plan (IDP) for the Dawid Kruiper Local Municipality, the unemployment rate (particularly the youth unemployment rate) in the municipal areas is very high. Diamond mining in the Rietfontein area seems to be a viable option for future development and special policies are included for handling mining land uses in the future. A study done by the Development Bank of Southern Africa (DBSA) indicated that several minerals can be found in Rietfontein area, with different potential levels for mining. The IDP further states that although the municipality is currently focused on agriculture, there is risk that seasonal changes, drought, flooding, weather extremes and changes in the world economy and politics may have severe impacts on the lives of the local communities. The municipality is focusing on the structuring of the Spatial Development Framework (SDF) to handle and accommodate the possibility of mining activities outside of the identified areas of the SDF, while protecting the core and buffer areas.

It is expected that should the prospecting operation be successful, the resulting mining project will contribute significantly to the local, regional, and national economy. The prospecting project will have limited socio-economic impacts since the project will be of short duration. The extent to which the project will contribute to the economy will be assessed during the impact assessment phase of the process.

## 6.2 Other guidelines

Other guidelines that were made use of include:

- Northern Cape Provincial Biodiversity Conservation Plan;
- DWS, 2010. Operational Guideline: Integrated Water and Waste Management Plan. Resource Protection and Waste;
- Department: Water Affairs and Forestry, 2007. Best Practice Guideline A2: Water Management for Mine Residue Deposits;
- Department: Water Affairs and Forestry, 2007. Best Practice Guideline A4: Pollution control dams;
- Department of Water Affairs and Forestry, 2008. Best Practice Guideline A6: Water Management for Underground Mines.
- White paper on Integrated Pollution and Waste Management in South Africa, 2000;
- Department of Water Affairs and Forestry, 2006. Best Practice Guideline G1 Storm Water Management;
- Department of Water Affairs and Forestry, 2006. Best Practice Guideline G2: Water and Salt Balances;
- Department of Water Affairs and Forestry, 2006. Best Practice Guideline G3. Water Monitoring Systems;
- Department of Water Affairs and Forestry, 2008. Best Practice Guideline G4: Impact Prediction;

- Department of Water Affairs and Forestry, 2008. Best Practice Guideline H1: Integrated Mine Water Management;
- Department of Water Affairs and Forestry, 2006. Best Practice Guideline H3: Water Reuse and Reclamation;
- DEAT. 2002. Integrated Environmental Management, Information series 2: Scoping. Department of Environmental Affairs and Tourism (DEAT. 2002);
- DEAT. 2002. Integrated Environmental Management, Information series 3: Stakeholder Engagement. Department of Environmental Affairs and Tourism (DEAT. 2002);
- DEAT. 2002. Integrated Environmental Management, Information series 4: Specialist Studies. Department of Environmental Affairs and Tourism (DEAT. 2002);
- DEAT. 2002. Integrated Environmental Management, Information series 12: Environmental Management Programmes. Department of Environmental Affairs and Tourism (DEAT. 2002);
- DEA. 2012. Companion to the EIA Regulations 2010, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs; and
- DEA. 2017. Guideline on Need and Desirability, Department of Environmental Affairs (DEA), Pretoria, South Africa.

# 7 Motivation

## 7.1 Benefits of Prospecting

For years, mining has been the driving force behind South Africa's economy and continues to make a valuable contribution to the country's economy. This economy is built on gold and diamond mining, with gold accounting for over a third of the country's exports. South Africa's diamond mining industry was recognised as one of the largest in the world in the year 2009. It is predicted that mining will still play an important role to the economy, most notably through foreign exchange earnings and employment provision. It is also one of the primary sectors that provide employment opportunities for unskilled and semi-skilled people. According to the Minerals Council in South Africa, in 2018 the mining sector contributed R351 billion to the South African Gross Domestic Product (GDP). A total of 456 438 people were employed in the mining sector in 2018 and each person employed in the mining sector has up to nine indirect dependants. Diamond mining's contribution to the GDP of South Africa is estimated to be at 18 % of the annual GDP.

Sales of sand and aggregate have increased exponentially both in volume and value terms. This was attributed to strong growth in the construction sector which showed double digit growth since 2004. During the past five years, employment in the sand and aggregate industry increased by 11.3 percent and remuneration by 21.2 percent, attributed to improved data collection and the boom in the construction sector.

The definition of prospecting in terms of the MPRDA states: "*intentionally searching for any minerals by means of any method which disturbs the surface or sub-surface of the earth, including any portion of the earth that is under the sea or under other water…*". Prospecting is the physical search for minerals, fossils, precious metals, or mineral specimens, which allows a company to survey or investigate an area of land for the purpose of identifying an actual or probable mineral deposit, before investments are made into the mining activities.

Assessment of the geological information available has determined that the area in question may have good quality diamond, sand, and trace gold reserves. In order to ascertain the above and determine the nature, location, and extent of the reserves within the proposed prospecting area, it will be necessary that prospecting be undertaken. The prospecting will also determine if there are any features that may have an impact on the economic extraction of the diamonds.

The information that will be obtained from the prospecting to be undertaken will be necessary to determine, should diamond reserves be found, how and where the diamonds will be extracted and how much economically viable reserves are available within the proposed prospecting area.

Should good quality diamond reserves be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued.

Temla 13 expects that benefits from the project will accrue to the immediate project area, the sub-region, and the province of the Northern Cape. This prospecting activity has a potential to temporarily contribute to decreasing unemployment rates in the surrounding areas, particularly during the construction and decommissioning phases of the project.

These potential benefits must be offset against the costs of the project, including the impacts to landowners and land occupiers. Further to the above, it has been determined that the prospecting project activities will not have a conflict with the spatial development plans for the

Dawid Kruiper LM and ZF Mgcawu District Municipality, the IDPs and the Environmental Management Framework (EMF) for the affected municipalities.

A process that ensures consultation with I&APs for the project is being undertaken. The stakeholder engagement process is being conducted is a way to provide all I&APs with an opportunity to comment on the project, with several platforms that allow public commenting opportunities to be offered to the I&APs. All issues raised by the I&APs will be recorded and addressed throughout the EIA process.

## 7.2 Environmental responsibility

It is expected that the prospecting activities will have negative environmental impacts, including, but not limited to the impacts that have been included in Section 13 of this report. However, due to the nature of prospecting, the impacts will be of short duration and limited locality.

The impacts will be investigated in detail during the impact assessment phase of the project. Where possible, measures to mitigate the impacts of the project will be identified and will be finalised during the impact assessment phase of the project. The mitigation measures will include designs and management practices that will be embarked on, to prevent and/or minimise the identified impacts on the social, cultural, and environmental aspects. For each potential significant impact identified, mitigation measures will be specified. Mitigation measures have been included in Section 13 of this report. These mitigation measures will be described in more detail in the EMPr that Temla 13 will be required to comply with throughout the prospecting period.

The EMPr will ensure that Temla 13 to keep track of the impacts of the project on the environment and where required, to take remedial action.

## 7.3 Socio-economic benefits

The proposed project will also result in job creation for local communities and a short-term boost for local businesses during the construction phase of the project. The prospecting itself will be undertaken by specialised sub-contractors and it is not anticipated that employment opportunities will be created in the operational phase of the project.

The information that will be obtained from the prospecting to be done will be necessary to determine, should minerals be found, how and where the different minerals will be extracted and how much economically viable reserves are available within the proposed prospecting area. This will allow Temla 13 to enter into further studies towards a Mining Right.

Should minerals be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued. Temla 13 expects that substantial benefits from the project (should minerals be found) will accrue to the immediate project area, the sub-region, and the province. This prospecting activity has a potential to decrease level of unemployment rate in proposed areas and surroundings. This prospecting activity will bring revenue into the city and the province which will in turn boost the economy of the country.

## 7.4 Needs and Desirability as per Government Regulation Notice 792 of 2012

The DEA (2017), Guideline on Need and Desirability, says that when evaluating project specific applications, the strategic context of such applications and the broader societal needs and the

public interest should be considered. The contents of Municipal IDP, SDF, EMF and other relevant plans frameworks and strategies must be considered. Whether a proposed activity will be in line with or deviate from the plan, framework, or strategy per se is not the issue, but rather the ecological, social, and economic impacts that will result because of the alignment or deviation". Where an application deviates from a plan, framework, or strategy the EIA must show why the deviation might be justifiable.

Considering the merits of a specific application in terms of the need and desirability consideration, it must be decided which alternative represents "the most practicable environmental option", which in terms of the definition in NEMA and the purpose of the EIA Regulations are *"that option that provides the most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society, in the long-term as well as the short-term*." This is the ultimate goal of the EIA process and has been fully addressed by the specialist studies that have been undertaken as well as the EIR and EMPr.

The DFFE 2017 Guideline on Need and Desirability says that during scoping the questions presented in the guideline document should be used to identify issues to be addressed in the EIA process and alternatives that should be considered. In the EIA/EMPr Report, the questions must again be considered, but for those questions for which the "scoping" found that no further information were required, it can simply be reported that the questions were dealt with during scoping, with the remaining questions having to be considered in terms of the additional information generated during the assessment stage. Table 7-1 presents the questions where responses emanate from additional information has been generated during the assessment stage.

**Table 7-1: Questions from DFFE 2017 Need and Desirability Guideline Document**

| | Questions (DFFE, 2017) | Response |
|---|---|---|
| | **PART I: NEED** | |
| 1. | Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority? | N/A, the proposed project has no bearing on the SDF. The current land use associated with the project area is agriculture. However, according to the Dawid Kruiper IDP, the unemployment rate (particularly the youth unemployment rate) in the municipal areas is very high. Diamond mining in the Rietfontein area seems to be a viable option for future development and special policies are included for handling mining land uses in the future. A study done by the DBSA indicated that several minerals can be found in Rietfontein area, with different potential levels for mining. The IDP further states that although the municipality is currently focused on agriculture, there is risk that seasonal changes, drought, flooding, weather extremes and changes in the world economy and politics may have severe impacts on the lives of the local communities. The municipality is focusing on the structuring of the SDF to handle and accommodate the possibility of mining activities outside of the identified areas of the SDF, while protecting the core and buffer areas.<br>It is expected that should the prospecting operation be successful, the resulting mining project will contribute significantly to the local, regional, and national economy. The prospecting project will have limited socio-economic |

| Questions (DFFE, 2017) | | Response |
|---|---|---|
| | | impacts since the project will be of short duration. The extent to which the project will contribute to the economy will be assessed during the impact assessment phase of the process. |
| 2. | Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occur here at this point in time? | Yes. The location of the proposed project components is constrained to the location with potential for the mineral resources (Diamond (Alluvial and Kimberlitic), Sand, Gravel, Trace Gold reserves). The project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting. In addition few fragments of severely weathered kimberlite were collected during site visit within project area. This confirms kimberlite presence within target area. Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous. Gravels moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades. As such, The current project location is considered the best option for the project. |
| 3. | Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level. | Yes. The proposed project will also result in job creation for local communities and a short-term boost for local businesses during the construction phase of the project. The prospecting itself will be undertaken by specialised sub-contractors and it is not anticipated that employment opportunities will be created in the operational phase of the project.<br>The information that will be obtained from the prospecting to be done will be necessary to determine, should minerals be found, how and where the different minerals will be extracted and how much economically viable reserves are available within the proposed prospecting area. This will allow Temla 13 to enter into further studies towards a Mining Right.<br>Should minerals be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued. Temla 13 expects that substantial benefits from the project (should minerals be found) will accrue to the immediate project area, the sub-region, and the province. This prospecting activity has a potential to decrease level of unemployment rate in proposed areas and surroundings. This prospecting activity will bring revenue into the city and the province which will in turn boost the economy of the country. |

| | Questions (DFFE, 2017) | Response |
|---|---|---|
| 4. | Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development? | The project will require the following services:<br>• Roads: The proposed project area already has existing roads through which it can be accessed. Additional access roads will be established around the project area.<br>• Electricity: The project will make use of generators to supply power. Electricity from Eskom will also be required.<br>• Water: It is anticipated that water will be required for dust suppression and other non-production purposes. This water will either be obtained from the Dawid Kruiper Local Municipality or underground. The Department of Water and Sanitation will be contacted to seek their recommendation on the use of water. |
| 5. | Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)? | This specific development is not included in the IDP of the municipality, however, according to the Dawid Kruiper Local Municipality IDP, the unemployment rate (particularly the youth unemployment rate) in the municipal areas is very high. Diamond mining in the Rietfontein area seems to be a viable option for future development and special policies are included for handling mining land uses in the future. A study done by the DBSA indicated that several minerals can be found in Rietfontein area, with different potential levels for mining.<br>The proposed project will not require the LM to make any changes to the placement of services and will therefore not have any implication on infrastructure planning. |
| 6. | Is the project part of a national programme to address an issue of national concern or importance? | No, however, the mining sector has been identified as one of the most significant sectors to drive job creation. Mining is considered to be one of the most significant sectors of the South African economy, providing jobs, contributing 8.6% to gross domestic product (GDP) and building relations with international trading partners. It is critical that South Africa's mineral resources be directed to benefit key social and economic objectives for sustained growth and meaningful transformation. |
| | **PART II: DESIRABILITY** | |
| 7. | Is the development the best practicable environmental option for this land/site? | Yes. The proposed project entails the prospecting of various minerals. The location of the proposed project components is constrained to the location with potential for the mineral resources (Diamond (Alluvial and Kimberlitic), Sand, Gravel, Trace Gold reserves). The project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting. In addition few fragments of severely weathered kimberlite were collected during site visit within project |

| Questions (DFFE, 2017) | | Response |
|---|---|---|
| | | area. This confirms kimberlite presence within target area. Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous. Gravels moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades. As such, The current project location is considered the best option for the project.<br>The current land use associated with the area is agriculture. The Dawid Kruiper IDA concedes that although the municipality is currently focused on agriculture, there is risk that seasonal changes, drought, flooding, weather extremes and changes in the world economy and politics may have severe impacts on the lives of the local communities. |
| 8. | Would the approval of this application compromise the integrity of the existing approved and credible IDP, and SDF as agreed to by the relevant authorities? | No. The proposed project entails the prospecting of various minerals on the identified project property. . The Dawid Kruiper Local Municipality Integrated Development Plan (IDP) identified mining as one of the major contributor to the municipality's GDP. The project will enable Temla 13 to determine if there are sufficient minerals to justify a full mining project.<br>Should minerals be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued. Temla 13 expects that substantial benefits from the project (should minerals be found) will accrue to the immediate project area, the sub-region, and the province. This prospecting activity has a potential to decrease level of unemployment rate in proposed areas and surroundings. This prospecting activity will bring revenue into the city and the province which will in turn boost the economy of the country. |
| 9. | Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g., as defined in EMFs), and if so, can it be justified in terms of sustainability considerations? | No. There is currently no EMF available for the project area, however, it is expected that the project will not compromise the integrity of any environmental management priorities for the area. The proposed project will result in negative environmental impacts that have been highlighted in Section 13. Mitigation measures have been identified, which Temla 13 will be required to implement to avoid and/or minimise the impacts.<br>In addition. The EMPr also includes a monitoring programme that Temla will be required to implement to assess the effectiveness of the identified mitigation measures. Should the mitigation measures not be effective in minimising impacts, Temla 13 will be required to investigate alternative measures to implement. |
| 10. | Do location factors favour this land use at this place? (This relates to the contextualization of | Yes. The proposed project entails the prospecting of (Alluvial and Kimberlitic), Sand, Trace Gold. The location |

| Questions (DFFE, 2017) | | Response |
|---|---|---|
| | the proposed land use on this site within its broader context). | of the proposed project components is constrained to the location with potential for the mineral resources. |
| 11. | How will the activity of the land use be associated with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)? | A biodiversity specialist study was undertaken as part of the impact assessment phase. The study found that the proposed project will result in clearance of vegetation, which will result in localised loss in vegetation, particularly around the proposed trenches/pits area, access roads and buildings. A biodiversity management plan was compiled and incorporated into the project EMPr.<br>A Phase 1 heritage impact assessment undertaken identified a burial site located on the project site. The burial site and associated 100m buffer will be demarcated as no-go areas, with access strictly forbidden. No other archaeological resources of importance were identified, however Temla 13 will be on the lookout for any other heritage resources that may been missed during the assessment, and should any resources be found; the chance find protocol that the heritage specialist will compiles will be implemented.<br>According to the wetlands specialist studies, there are a number of wetlands located on the property area. The wetland specialist identified mitigation measures that Temla 13 will be required to implement to avoid and/or minimise wetlands impacts. In addition, the wetland areas and associated 32m buffer areas were demarcated as no-go areas.<br>In addition, the proposed project has potential to impact on water resources (surface and groundwater) as provided in Section 13. Mitigation measures to be implemented to avoid and/or minimise impacts from the project have been identified and included in the EMPr. Water monitoring plans have been incorporated into the EMPr. |
| 12. | How will the development impact on people's health and well-being? (E.g., In terms of noise, odours, visual character and sense of place, etc.)? | The proposed project will provide employment opportunities, skills development, social development programmes, community upliftment and economic injection to the local area. Furthermore, negative impacts including visual, traffic, service delivery, land use changes and security and safety have been assessed and discusses in Section 13. The socio-economic impacts that may occur include:<br>• Nuisance noise due to prospecting activities and drilling;<br>• Nuisance air emissions from prospecting activities and movement or vehicles which will result in nuisance dust generation;<br>• Safety concerns as a result of movement of additional traffic on the roads, transporting ore and material to and from the project;<br>• Influx of jobseekers to site, which may result in an increase in opportunistic crime; |

| Questions (DFFE, 2017) | | Response |
|---|---|---|
| | | • Potential pollution of water resources (wetlands, ground, and surface water);<br>• Uncontrolled access to private property outside of the demarcated boundaries; and<br>• Visual impact as a result of the vegetation clearance lighting, movement of vehicles and machinery as well as presence of drill rigs.<br>Management and mitigation measures must be implemented to prevent environmental pollution which may impact on environmental resources utilised by communities, landowners, and other stakeholders. Measures to manage the potential impacts on communities, individuals or competing land uses in close proximity have been included in Section 13. |
| 13. | Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs? | No. The proposed project entails the prospecting of (Alluvial and Kimberlitic), Sand, Trace Gold. The location of the proposed project components is constrained to the location with potential for the mineral resources.<br>The proposed project will result in temporary creation of employment of locals during the construction phase of the project. It is expected that during the operation phase the project will not result in the creation of employment as prospecting requires highly specialised personnel. However, should minerals be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued. Temla 13 expects that substantial benefits from the project (should minerals be found) will accrue to the immediate project area, the sub-region, and the province. This prospecting activity has a potential to decrease level of unemployment rate in proposed areas and surroundings. This prospecting activity will bring revenue into the city and the province which will in turn boost the economy of the country.<br>In addition, the proposed project area is currently being used for agriculture. It is expected that due to the low rainfall and high temperatures and evapotranspiration, the agriculture potential of the area is low. The IDP for Dawid also stipulates that although the municipality is currently focused on agriculture, there is risk that climate change and changes in the world economy and politics may have severe impacts on the lives of the local communities. |
| 14. | Will the proposed land use result in unacceptable cumulative impacts? | No. It is expected that the project may result in low cumulative impacts on the environment. A cumulative impact assessment was undertaken as part of this impact assessment phase of the process and mitigation measures have been identified by the specialists and EAP team. Section 13.4 provides details of the cumulative impact assessment.<br>A site specific EMPr has been compiled for the project. It is expected that implementation of the mitigation measures included in the EMPr will reduce the |

| Questions (DFFE, 2017) | | Response |
|---|---|---|
| | | significance of the impact during all phases of the proposed project. |

## 7.5 No-go option

The option of not approving the activities will result in a significant loss of valuable information regarding the mineral status (in terms of diamond reserves, Sand and Trace Gold), present on the identified properties. In addition, should economical reserves be present, and the applicant does not have the opportunity to prospect the opportunity to utilize these reserves for future phases and the potential positive socio-economic impacts that would result from the resultant prospecting project will be lost.

# 8 Motivation for the Preferred Development Footprint

The identification and investigation of alternatives is a key aspect during the scoping and impact assessment process. All reasonable and feasible alternatives must be identified and assessed during the scoping phase to determine the most suitable alternatives to consider and assess during the impact assessment phase. There are however some significant constraints that have to be taken into account when identifying alternatives for a project of this scope. Such constraints include social, financial, and environmental issues, which will be discussed in the evaluation of the alternatives. The preferred option is to be highlighted and presented to the authorities.

Alternatives can typically be identified according to:

- Location alternatives;
- Process alternatives;
- Technological alternatives; and
- Activity alternatives (including the No-go option).

For any alternative to be considered feasible, such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. The alternatives are described, and the advantages and disadvantages are presented. It is further indicated which alternatives are considered feasible from a technical as well as environmental perspective.

Incremental alternatives typically arise during the impact assessment process and are usually included as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation measures and are not specifically identified as distinct alternatives. This section provides information on the development footprint alternatives, the properties considered, as well as the type of activity, activity layout, technological and operational aspects of the activity.

## 8.1 The property on which or location where it is proposed to undertake the activity

The prospecting area is dominated by sedimentary rocks including sand and calcrete as shown in Figure 8-1. The Project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting. In addition few fragments of severely weathered kimberlite were collected during site visit within project area. This confirms kimberlite presence within target area. Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous. Gravels moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades.

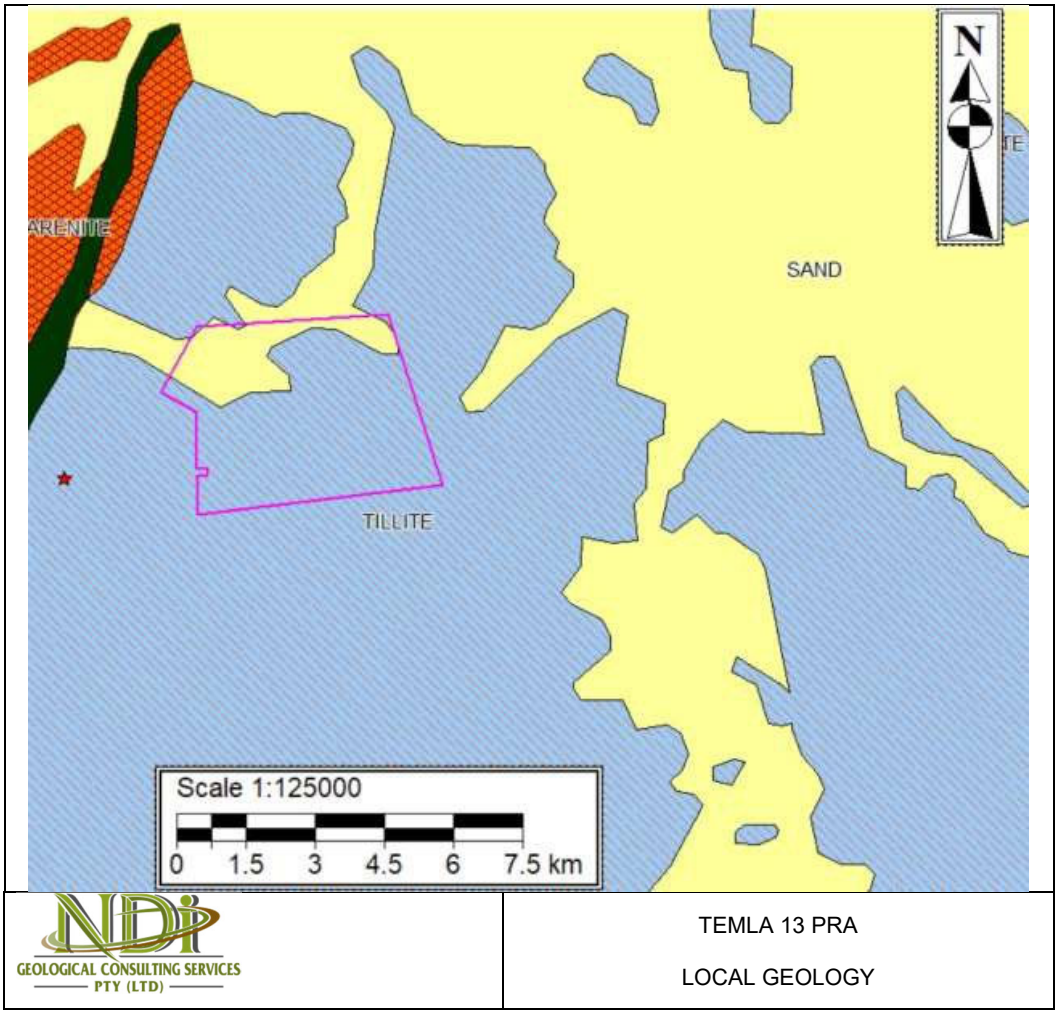



**Figure 8-1: Geology of the application area and its surroundings**

As such, no property alternatives were considered for the location of the prospecting area.

## 8.2 Type of Activity

An alternative to the type of activity would be agriculture. According to the IDP for the Dawid Kruiper Local Municipality, the unemployment rate (particularly the youth unemployment rate) in the municipal areas is very high. Diamond mining in the Rietfontein area seems to be a viable option for future development and special policies are included for handling mining land uses in the future. A study done by the DBSA indicated that several minerals can be found in Rietfontein area, with different potential levels for mining. The IDP further states that although the municipality is currently focused on agriculture, there is risk that seasonal changes, drought, flooding, weather extremes and changes in the world economy and politics may have severe impacts on the lives of the local communities. The municipality is focusing on the structuring of the SDF to handle and accommodate the possibility of mining activities outside of the identified areas of the SDF, while protecting the core and buffer areas.

The land use alternatives have been investigated, assessed, and presented in this report.

## 8.3 Design or Layout of the Activity

Since no complicated surface infrastructure will be required for this project no design and layout alternatives for the proposed project were determined. Due to the nature of the proposed prospecting activities, future land use alternatives will not be compromised.

No fatal flaws have been identified by specialist studies. The applicant will avoid development and placement of infrastructure in areas associated with sensitive environmental aspects and buffer areas recommended by the specialists. The heritage resources and wetlands specialists have recommended buffer areas within which no project activities may be allowed so as to minimise and/or avoid impacts and edge effects on the burial site and wetlands in the area. The no-go areas are shown in Figure 15-1.The applicant will ensure that the final layout of the project excludes activities in the no-go area

## 8.4 The Technology to be used in the Activity

In terms of the proposed technologies, these have been chosen based on long term proven success in prospecting. The prospecting activities proposed in the PWP are dependent on the preceding phase (desktop studies), therefore no alternatives have been indicated. The location of the intrusive drilling activities will be determined during Phase 1 of the Prospective Works Programme. All infrastructure will be temporary and/or mobile.

## 8.5 The Operation Aspects of the Activity

No permanent services in terms of water supply, electricity, and or sewage facilities will be required. Temporary access roads will however be constructed in areas where there are no existing access routes. The activities will commence with Phase 1 and undertaken as described in Section 5.

## 8.6 The Option of Not Implementing the activity

The option of not approving the activities will result in a significant loss of valuable information regarding the mineral status (in terms of Diamond (Alluvial and Kimberlitic), Sand, Gravel Trace Gold), present on the identified properties. In addition, should economical reserves be present, and the applicant does not have the opportunity to prospect, the opportunity to utilize these reserves for future phases will be lost.

The environmental, social, and economic impacts have been assessed in detail and included in Section 13 of this report.

# 9 Public Participation process

The objectives of stakeholder engagement for the different phases of the application are as follows:

- During scoping: The objectives of the stakeholder engagement during scoping phase is to provide sufficient and accessible information to stakeholders in an objective manner to enable them to raise issues of concern and suggestions for enhanced benefits and to verify that their issues have been recorded. The stakeholders can also provide input into the ToR for specialist studies, impact assessment and management planning and contribute relevant local and traditional knowledge to the environmental assessment;
- During impact assessment: The objectives of the stakeholder engagement during the impact assessment phase are to verify that their issues have been considered in the EIA and to further comment on the findings of the environmental assessment; and
- During the decision-making phase: Following the outcome of the decision-making process by authorities, stakeholders will be informed of the outcome and how and by when the decision can be appealed.

The stakeholder engagement process will be conducted in terms of NEMA, which provides clear guidelines for stakeholder engagement during an EIA as summarised in Table 9-1.

**Table 9-1: NEMA Stakeholder Guidelines**

| NEMA Section | Applicability to Stakeholder Engagement |
|---|---|
| **Chapter 1** | Outlines the principles of environmental management, several pertaining to public consultation (e.g. Chapter 1, subsections (2), (3), (4) (f), (g), (h), (k), (q) and (r). |
| **Chapter 6**, | Regulations 39 – 44 of the amended EIA Regulations GNR) 326, promulgated on 8 December 2014, specify the minimum requirements for stakeholder engagement in an EIA process conducted under the NEMA. |
| **Section 24J of the NEMA** | In 2017, the Minister of Environmental Affairs published, Section 24J of the NEMA in terms of**,** Public Participation Guidelines which guide the Public Participation Process in order to give effect to Section (2)(4)(f), (o) and 24 (1A)(C) of the NEMA. |

Figure 9-1 provides a diagram of an Integrated Stakeholder Engagement Process for the proposed project.

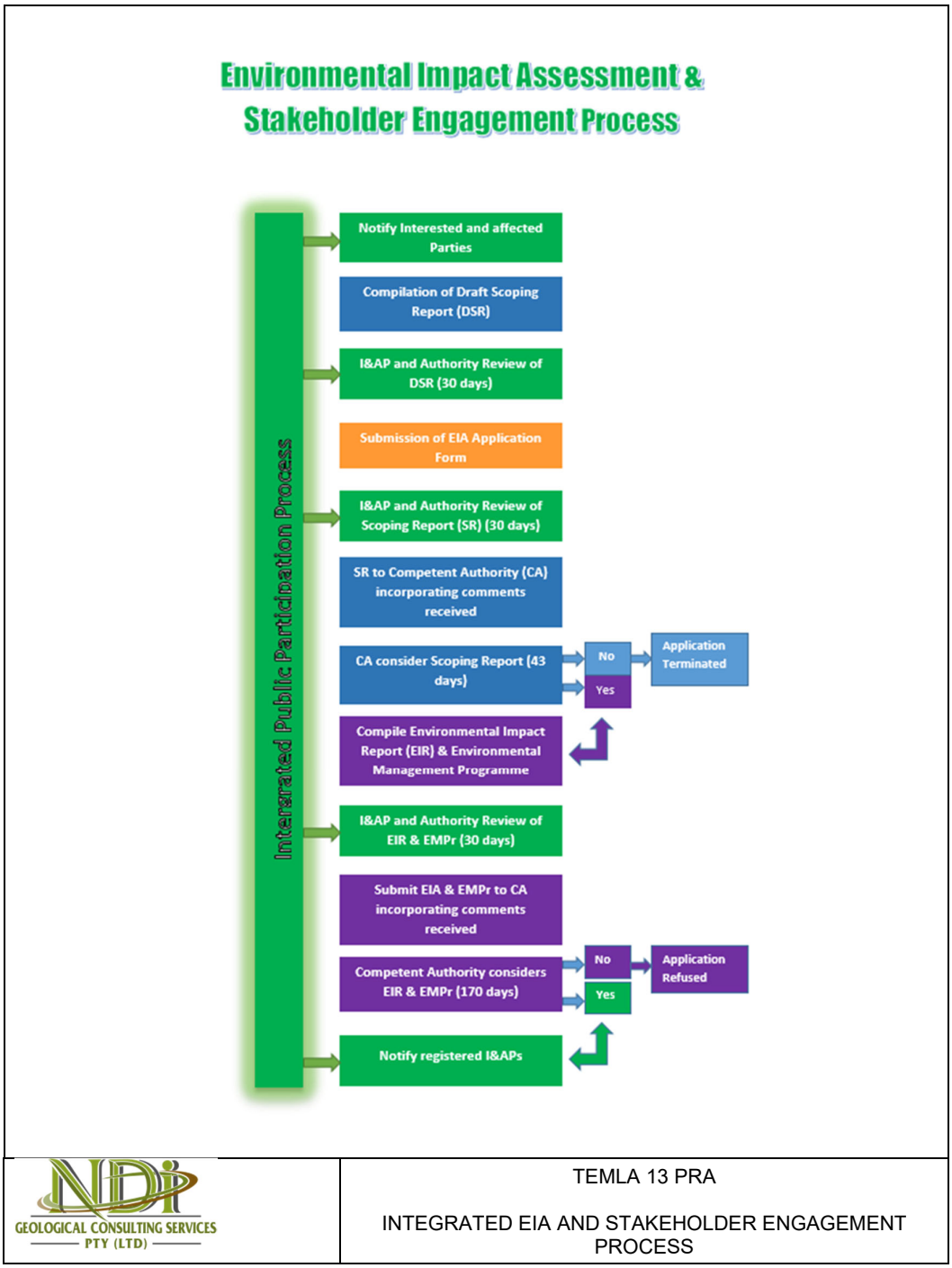



**Figure 9-1: Integrated EIA and Stakeholder Engagement Process**

All the above-mentioned guidelines have been incorporated into this stakeholder engagement process. The application will be submitted to the DMR for authorisation as the competent authority. Identified commenting authorities on this application include:

- DWS – Regional Office;
- South African Heritage Resources Agency (SAHRA) – Provincial;
- Dawid Kruiper Local Municipality;

- ZF Mgcawu District Municipality (previously known as Siyanda District Municipality); and
- DENC.

# 9.1 Scoping Phase

## 9.1.1 Stakeholder Identification Interested and Affected Parties

I&APs were identified using Geographic Information System (GIS) and cadastral information to identify affected and adjacent properties. The affected and adjacent property owners were identified using the surveyor general website, www.deedsweb.gov.za. In addition, registered I&APs were also sourced from responses to the advertisements, site notices and written notification to I&APs associated with the project.

The I&APs register will be maintained for the duration of the study where the details of stakeholders are captured and automatically updated upon communication to the EAP. The identification, registration, and comments from I&APs will be an on-going activity.

The identified affected and adjacent properties are provided in Table 9-2 and Table 9-3.

**Table 9-2: List of Affected Farm and Farm Portions**

| Farm | Portions | 21 Digit Survey General Code |
|---|---|---|
| Mier 585 | A portion of the Farm | C02800000000058500000 |

**Table 9-3: List of Adjacent Farm and Farm Portions**

| Farm | Portions | 21 Digit Survey General Code |
|---|---|---|
| Windhoek 122 | Remainder | C02800000000012200000 |
| Oxford 123 | Remainder | C02800000000012300000 |
| Rietfontein 108 | Remainder | C02800000000010800000 |
| Koppies Kraal Pan 129 | Remainder | C02800000000012900000 |
| Mier 585 | Portion 95 | C02800000000058500095 |
| Mier 585 | Portion 97 | C02800000000058500097 |
| Mier 585 | Portion 98 | C02800000000058500098 |
| Mier 585 | Portion 100 | C02800000000058500100 |
| Mier 585 | Portion 103 | C02800000000058500103 |
| Mier 585 | Portion 105 | C02800000000058500105 |
| Mier 585 | Portion 106 | C02800000000058500106 |
| Mier 585 | Portion 107 | C02800000000058500107 |
| Mier 585 | Portion 96 | C02800000000058500096 |
| Middlepost 124 | Remainder | C02800000000012400000 |
| Mooi Rivier | Remainder | C02800000000010900000 |
| Mier 585 | Portion 104 | C02800000000058500104 |
| Oxford 123 | Portion 1 | C02800000000012300001 |

A map of the affected and adjacent farm portions and farm portions of the site is provided in Figure 9-2.

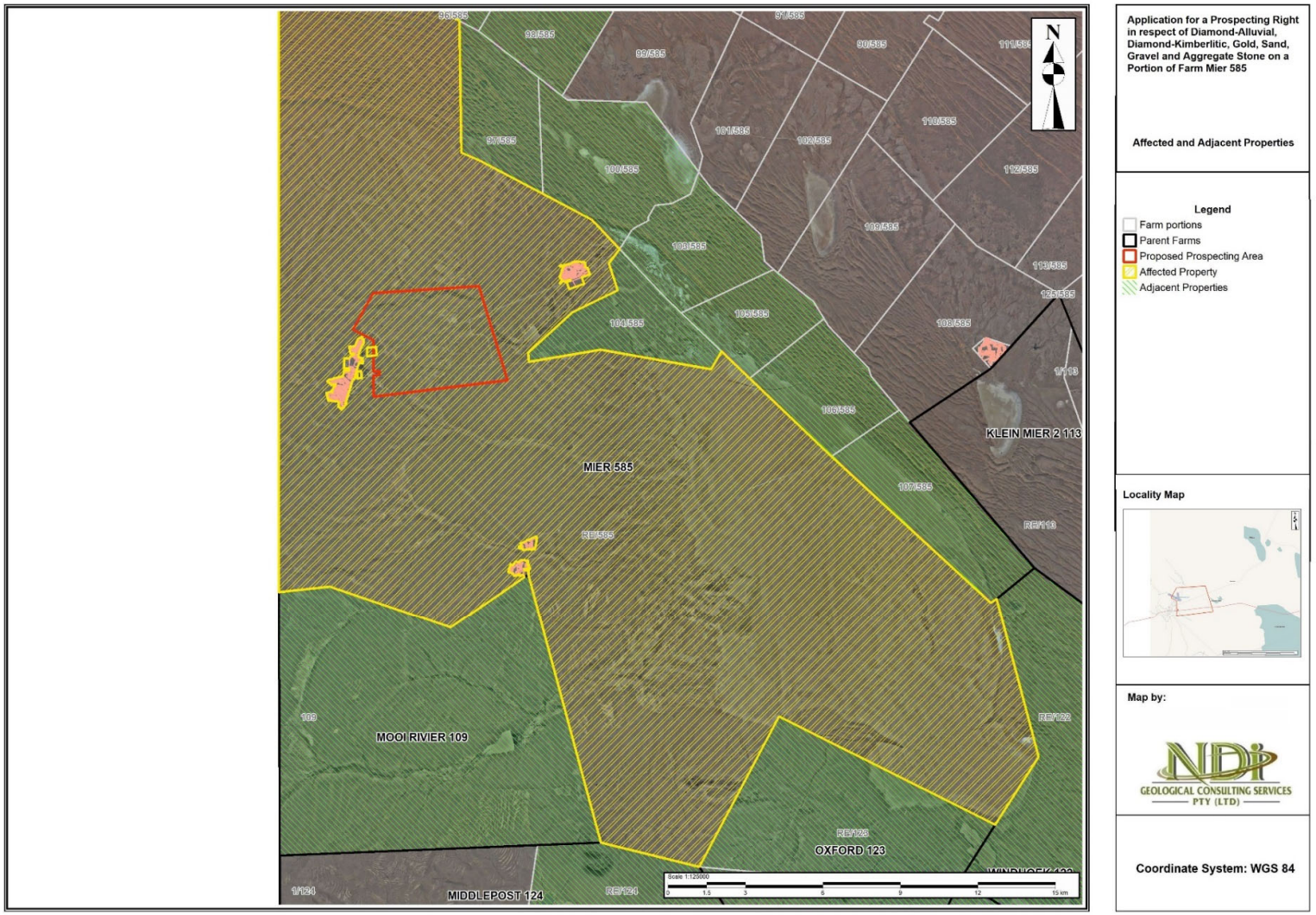



**Figure 9-2: Affected and Adjacent Properties**

### 9.1.2 Notification and Registration of the I&APs

Ndi Geological made use of various methods to inform stakeholder of Temla 13's intention to undertake the required EA/WML process. Stakeholders were provided with the opportunity to participate and register as I&APs during the announcement phase of the project.

#### Distribution of Notification Letters

Notification letters were sent to identified I&AP's, informing them of the proposed project.

#### Site Notice Placements

Sites notice boards (Size A2: 600 mm X 420 mm) notifying stakeholders and I&AP's of the proposed activity were placed at conspicuous places in the project area. These areas of placement were determined according to the quantity of potential I&AP's that may pass by.

#### Newspaper Advertisements

Newspaper advertisements (English and vernacular) notifying stakeholders about the proposed project and the opportunity to participate in the EIA process were placed in the newspapers.

### 9.1.3 Notification of the Availability of the Draft Scoping Report

The availability of the Draft Scoping Report (DSR) was announced by means of SMS, letters, and emails to registered I&APs. The DSR, announcement letters and comment forms were made available for public viewing and comment in the same public places as for the project announcement phase.

### 9.1.4 Stakeholder commenting period

The Scoping Report was made available for a 30-day commenting period from 16 September 2022 to 17 October 2022.

The Scoping Report was also be made available to the competent and commenting authorities during the 30-day stakeholder review and commenting period. Stakeholders are encouraged to submit their written comments to the EIA team through the contact details provided. Stakeholders could also fill in comment forms at one of the public places and/or contact the EAP via telephone, email, or fax to submit comments and to discuss any issues of concern.

All comments received to date have been included in this draft EIA/EMPr Report.

### 9.1.5 Public Meeting

A public meeting was held during the scoping phase of the project, where the stakeholders had the opportunity to comment on and discuss the report and plan of study and raise issues that may need to be included in the impact assessment phase.

All comments received to date have been included in this draft EIA/EMPr Report.

## 9.2 Impact Assessment Phase

The Public Participation Process will be ongoing throughout all the project phases. The stakeholder engagement process for the Impact Assessment Phase is presented below.

### 9.2.1 Notification Letter

A notification letter informing registered I&APs of the public comment period for the draft EIA/EMPr Report and details of the public meeting was distributed to I&APs via email and SMS.

### 9.2.2 Draft Report Commenting Period

The Draft EIA/EMPr will be made available to I&APs for a 30-day comment period between 23 June 2023 and 24 July 2023 on Ndi Geological's website (http://www.ndigeoservices.co.za/). Hard copies will also be made available for perusal at the venues used for the Draft Scoping Report.

### 9.2.3 Public Meeting

Depending on the responses received during the registration period, and where requested by the stakeholders, a public meeting may be held with the I&APs.

### 9.2.4 Notification of authority decision

Registered stakeholders will be advised in writing (mail, email, fax, and SMS) of the authority decision on the EIA / EMPr, and details on the procedure to appeal the decision. Notification to registered stakeholders will summarise the authorities' decision and provide information according to legal requirements on how to lodge an appeal should they so wish.

### 9.2.5 Summary of Issues Raised by I&APs

The comments received to date have been  comments that have been included in Table 9-4..

**Table 9-4: Summary of the Issues Raised by the I&APs**

| **Interested and Affected Parties**<br><br>**List the names of persons consulted in this column, and**<br>**Mark with an X where those who must be consulted were in fact consulted.** | | **Date Comments Received** | **Issues raised** | **EAPs response to issues as mandated by the applicant** | **Consultation Status (Consensus dispute, not finalised, etc)** |
|---|---|---|---|---|---|
| AFFECTED PARTIES | | | | | |
| Landowner/s | | | | | |
| | | | | | |
| Lawful occupier/s of the land | | | | | |
| Landowners or lawful occupiers on adjacent properties | | | | | |
| Ds A.J. Williamse | X | 3 October 2022 | The applicant must do prospecting work over the area and empower local people as much as possible. | The EAP concurs with the comment. Provision for employment of locals will be included in the EMPr to ensure that Temla implements it. It must however be noted that most of the employment opportunities for locals will be during the construction phase of the project. | Consensus |
| Ds A.J. Williamse | X | 3 October 2022 | The company must support local people. | The proposed project is expected to create employment opportunities for the locals as well as support local small businesses and suppliers. | Consensus |
| Michael Beukes | X | 3 October 2022 | The company must employ local people from the community of Rietfontein. If the skill that is needed is not in the community the company must look at the nearest town before they can bring people in from afar. | | Consensus |
| Michael Beukes | X | 3 October 2022 | It will be good if the company can bring work to the area because they are sitting with a problem of youth unemployment in the area. | | Consensus |
| Michael Beukes | X | 3 October 2022 | Community must be more informed about the MP PR MR so that they can start to apply for the mineral that are on their farms. | The community will be informed of the outcome of the application once the DMR has made a decision per the requirements of Chapter 6 of the NEMA. Should Temla decide to apply for a Mining Right, an | Consensus |

| **Interested and Affected Parties**<br><br>**List the names of persons consulted in this column, and**<br>**Mark with an X where those who must be consulted were in fact consulted.** | | **Date Comments Received** | **Issues raised** | **EAPs response to issues as mandated by the applicant** | **Consultation Status (Consensus dispute, not finalised, etc)** |
|---|---|---|---|---|---|
| | | | | additional application process and stakeholder engagement process will be required. | |
| Ds A.J. Williamse | X | 3 October 2022 | He is happy to see that the applicant is one of the local people. | Noted | Consensus |
| Michael Beukes | X | 3 October 2022 | He is happy that the company is talking about skills transfer. | | Consensus |
| Municipal councillor | | | | | |
| Municipality | | | | | |
| Organs of state (Responsible for infrastructure that may be affected Roads Department,<br>Eskom, Telkom, DWA | | | | | |
| | | | | | |
| | | | | | |
| Communities | | | | | |
| | | | | | |
| Dept. Land Affairs | | | | | |
| | | | | | |
| Traditional Leaders | | | | | |
| Dept. Environmental Affairs | | | | | |
| Other Competent Authorities affected | | | | | |
| <u>OTHER AFFECTED PARTIES</u> | | | | | |

| **Interested and Affected Parties**<br><br>**List the names of persons consulted in this column, and**<br>**Mark with an X where those who must be consulted were in fact consulted.** | **Date Comments Received** | **Issues raised** | **EAPs response to issues as mandated by the applicant** | **Consultation Status (Consensus dispute, not finalised, etc)** |
|---|---|---|---|---|
| | | | | |
| INTERESTED PARTIES | | | | |
| | | | | |

# 10 Baseline Characterisation

This section provides a general overview of the status quo of the environmental and social context within which the proposed project is located. All of the proposed activities will take place within the affected properties. While most of the descriptions below are focused on the site itself, where necessary the regional context of the environmental features is also explained. The details on certain aspects of this environment have are based on findings from work undertaken during specialist investigations. For each environmental aspect discussed below, proposed environmental issues/impacts have been highlighted qualitatively where applicable in Section 13 of this report.

## 10.1 Regional Setting

The proposed project is located within the Northern Cape Province, under the jurisdiction of the ZF Mgcawu District Municipality (previously known as Siyanda District Municipality as shown in Figure 10-1. The Dawid Kruiper Local Municipality is a Category B municipality that forms part of the ZF Mgcawu District in the Northern Cape. It borders with the Kgalagadi Transfrontier Park in the north, Botswana in the north-east, and Namibia in the west. It is the largest of five municipalities in the district, making up almost half its geographical area. It was established by the amalgamation of the Mier and //Khara Hais Local Municipalities in August 2016. It consists of small towns and the !Khomani San community within its jurisdiction. Rietfontein, which is one of the main towns, is situated approximately 280km north-west from the nearest big town of Upington. Upington is situated 400km west of Kimberley and has an airport and a landing strip. Natural boundaries provide a unique aspect to the town – one is the Kalahari Desert, and another is the Orange River, South Africa's largest river, which it straddles. The municipality is the acknowledged commercial, educational, military, agricultural, medical, transport and tourism centre of the area.

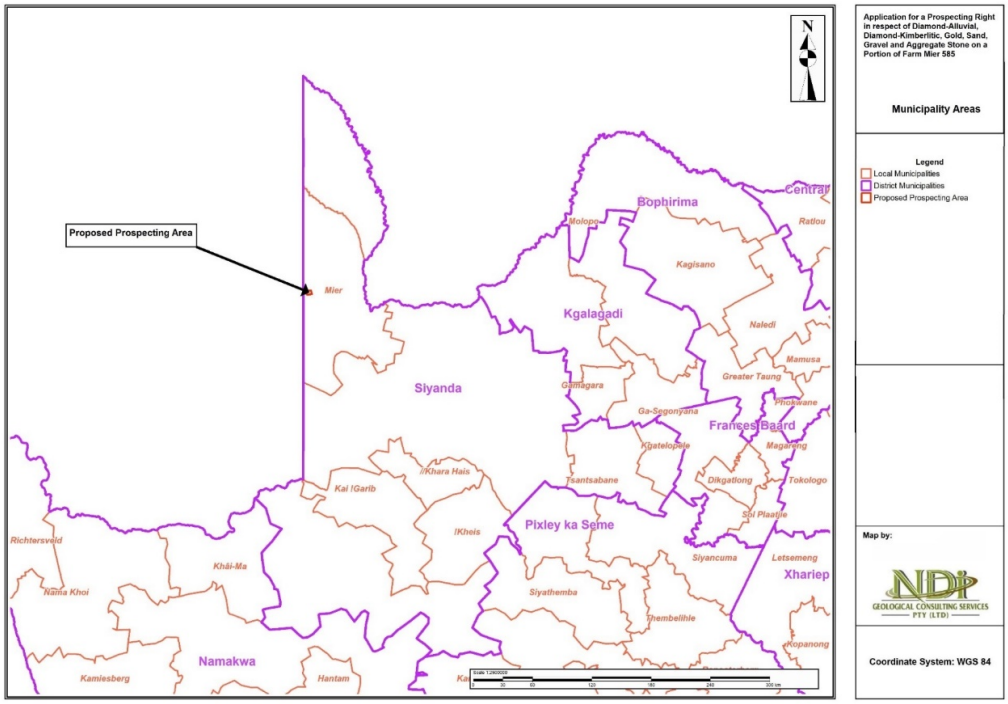
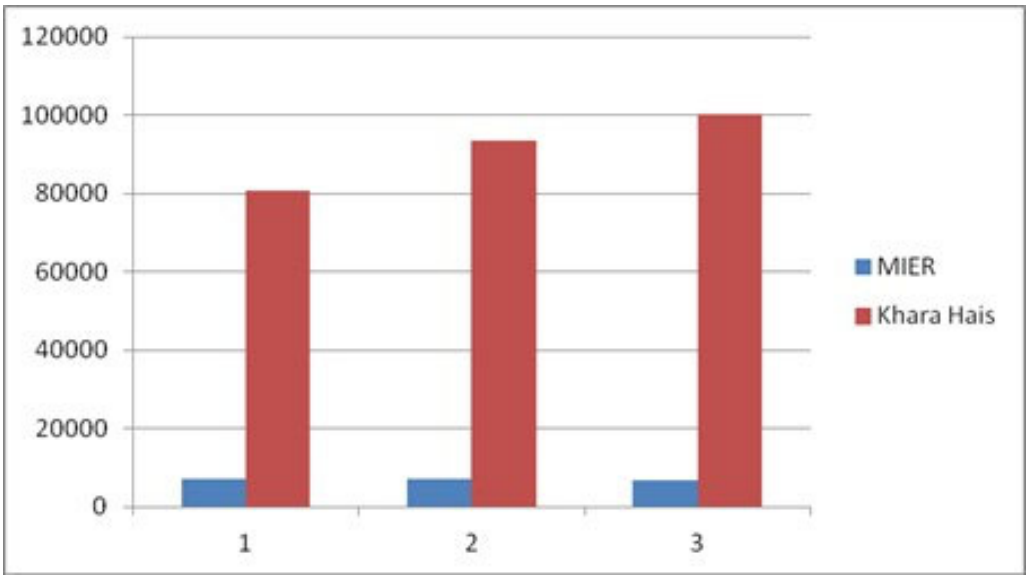



**Figure 10-1: Location of the Project Area within the Northern Cape Province**

## 10.1.1 Demographics

Dawid Kruiper Local Municipality is the most populous municipality in ZF Mgcawu District. The graph below indicates that there is currently 6 879 people within the Mier area which in terms of the demographic spread are scattered compared to the 100 282 within the former Khara Hais/Upington area, which brings the total population to 107 162 within the Dawid Kruiper jurisdiction. Figure 10-2 and Table 10-1 provide the summaries of population levels from 1996 to 2016 for Dawid Kruiper Local Municipality.

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DAVID KRUIPER POPULATION

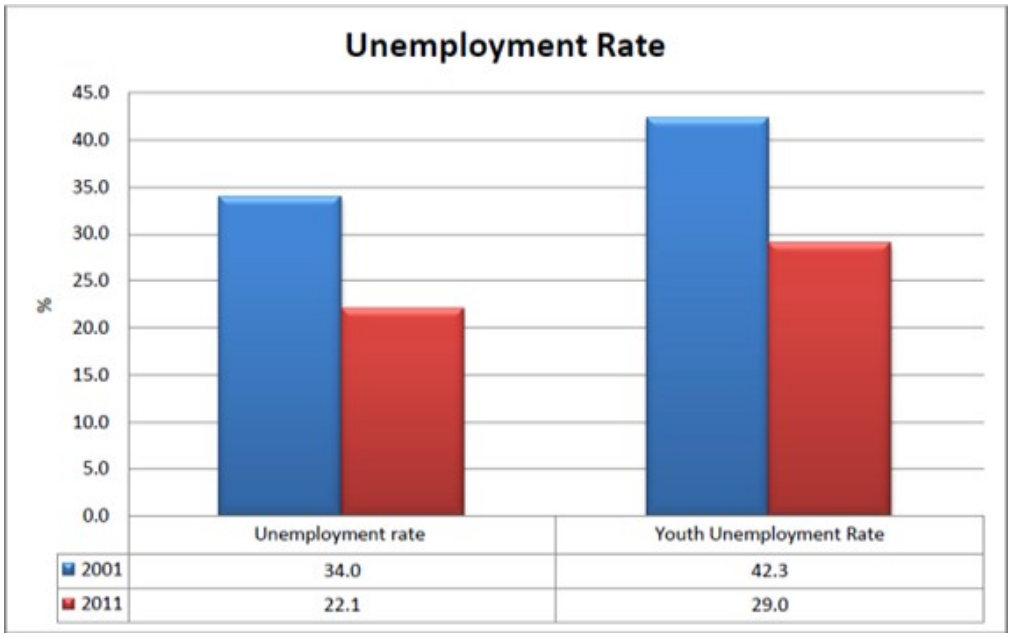
**Figure 10-2: Population Levels from 1996 to 2016**

**Table 10-1: Population Levels between 1996 and 2016**

| | **1996** | **2011** | **2016** |
|---|---|---|---|
| Mier | 7026 | 7 003 | 6 879 |
| Khara Hais | 80 823 | 93 494 | 100 282 |

## 10.1.2 Unemployment Levels

The unemployment rate decreased significantly from 34% in 2001 to 22.1% in 2011 as presented in Figure 10-3. There was a huge decline in the youth unemployment rate too from 42.3% in 2001 to 29% in 2011but the youth unemployment rate is still very high in comparison with the overall unemployment rate of the municipality. Although about 44.7% of the Dawid Kruiper population are between14 and 35 years old, youths remain relatively marginalised.

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DAVID KRUIPER UNEMPLOYMENT RATES

**Figure 10-3: Unemployment Rates (Source – Stats SA**

### 10.1.3 Educational Levels

An increase of 5.1% (20.9% in 2001 to 26% in 2011) of people living in Dawid Kruiper over the age of twenty years have completed the 12th grade while there was a significant decline of 6.5% (13.6 in 2001 to 7.1% in 2011) in people that had no schooling at all. Higher education increases from 20.9% in 2001 to 26% in 2011 (Figure 10-4).

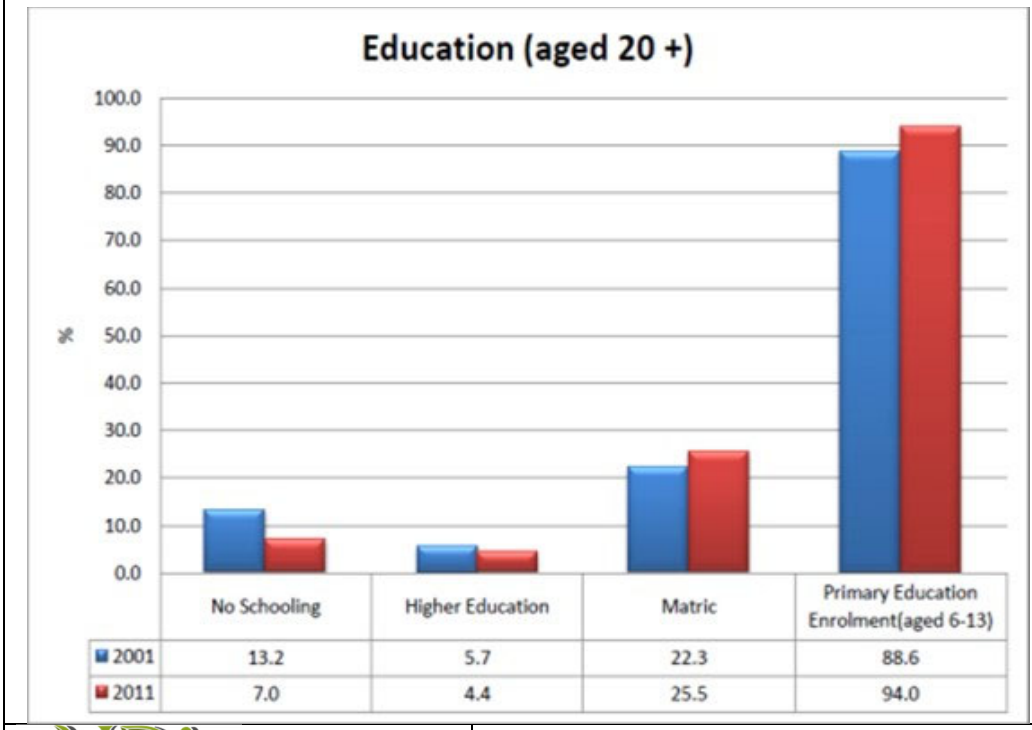



**Figure 10-4: Education Status (Source – Stats SA)**

## 10.2 Climatic Conditions

### 10.2.1 Regional

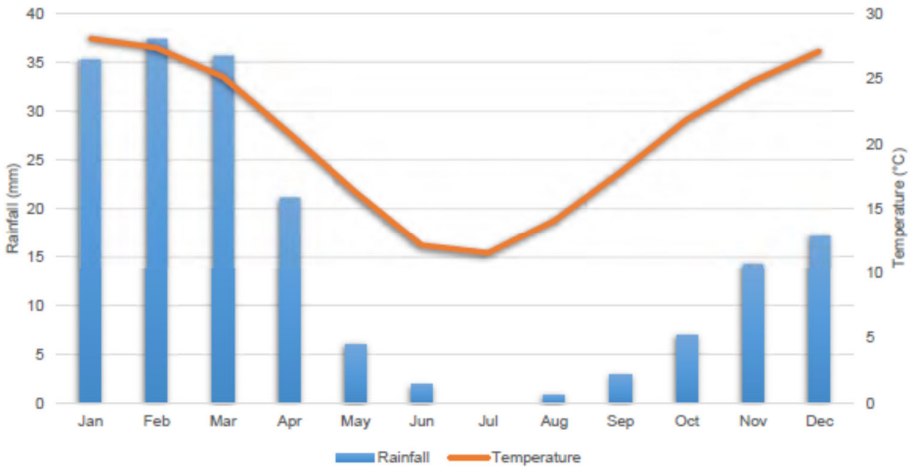
The climate of the Northern Cape province is semi-arid, characterised by a summer-autumn rainfall regime and very dry winters.

The study area is within the Dawid Kruiper LM which experiences summer rainfall region of South Africa which commences in October and ends in April. The peak rainfall months are November to April while the lowest rainfall months are July and August. Rainfall in the Dawid Kruiper municipality is already very variable, ranging from 20-300mm per year, and very low compared with the rest of South Africa. There are already noticeable water constraints that impact on the ability of the municipality to deliver water services effectively. Median and worst-case scenarios predict a decrease in rainfall for winter rainfall areas such as this, with average annual rainfall projected to decrease by up to 30% along the west coast by 2100. This drying trend is particularly strong towards the end of the rainy season. A best-case scenario to 2050 indicates there may be some early increase in rainfall, followed by drying later as frontal systems shift southwards. There are likely to be more frequent and more intense rainfall related extreme weather events such as droughts and storms. Dawid Kruiper is already drought prone, and while little change is projected in the immediate future, droughts are expected to increase in frequency and severity by up to 50% towards the end of the century.

### 10.2.2 Local

The proposed project area is located within a region that is classified as Tropical shrubland ("TBSh") in terms of the Food and Agriculture Organisation (FAO) Global Ecological Zone classification system. In this region, rainfall generally becomes lower and lower closer to the tropics, while temperatures remain high. Rainfall is always less than 1000 mm and seldom reaches 200 mm in the drier parts. The mean temperature of the coldest month is generally more than 20°C, except in the Kalahari where mean temperatures are lower due to the proximity of the sea.

Figure 10-5 shows the average monthly temperature and rainfall at Rietfontein from 1901 to 2016 (World Bank Group, 2021). Average annual rainfall is approximately 179.7 mm, with most of the rainfall falling in January, February, and March. Little or no rain falls in June, July, and August. The average monthly temperature is 20.7°C, and ranges between 16.3°C in May and 28.1°C in January.

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AVERAGE MONTHLY TEMPERATURE AND RAINFALL

**Figure 10-5: Average monthly temperature and rainfall from 1901 to 2016 (World Bank Group, 2021)**

Figure 10-6 presents the annual wind rose for the Karoo Station, the closest weather station to the preferred sites. The prevailing wind is generally from the southwest. Ambient wind speeds are mostly gentle, ranging between 4 and 10 m/s.

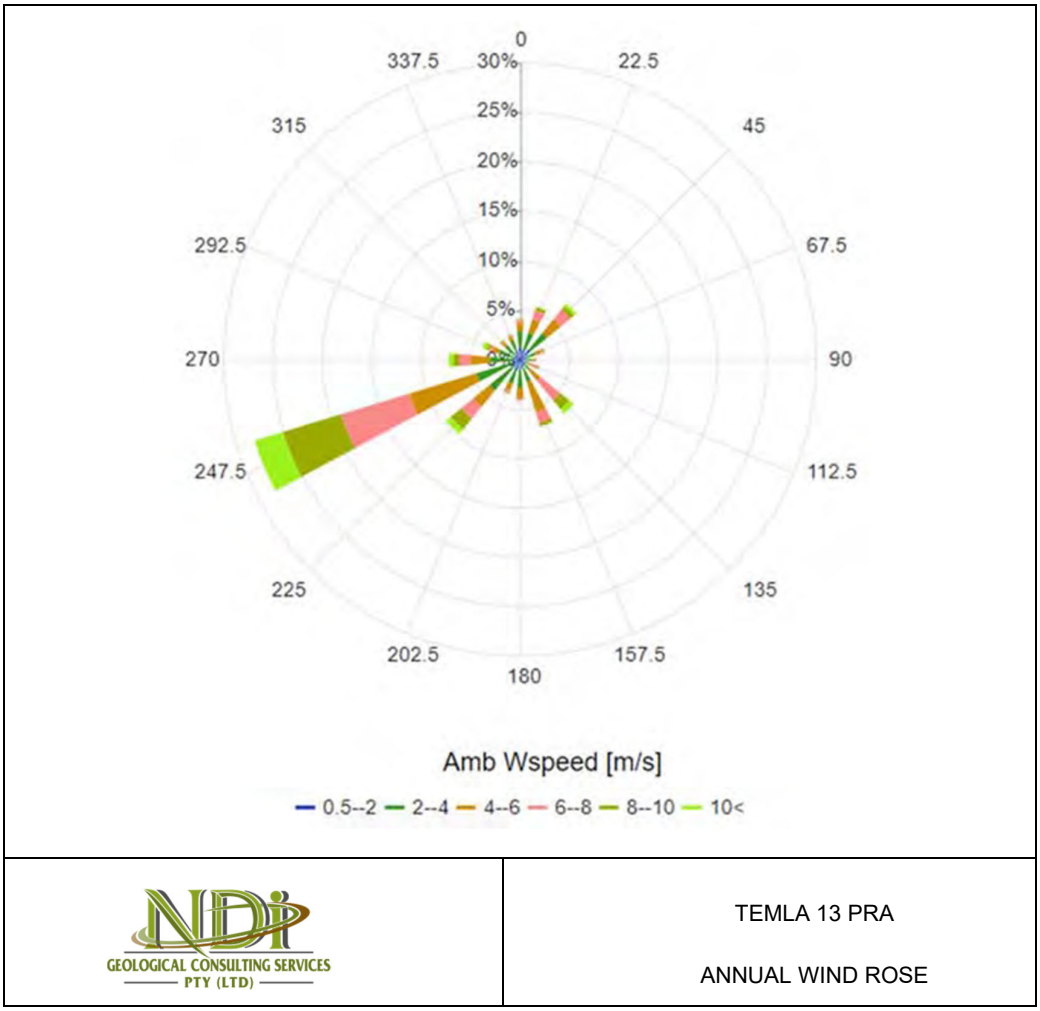



**Figure 10-6: Annual wind rose for the Karoo Station (SAAQIS, 2021)**

## 10.3 Topography

The topography of the site is described as flat, with the elevation lying between 820 and 840 metres above mean sea level (mamsl).

The topography of the study area is shown in Figure 10-7 and Figure 10-8.

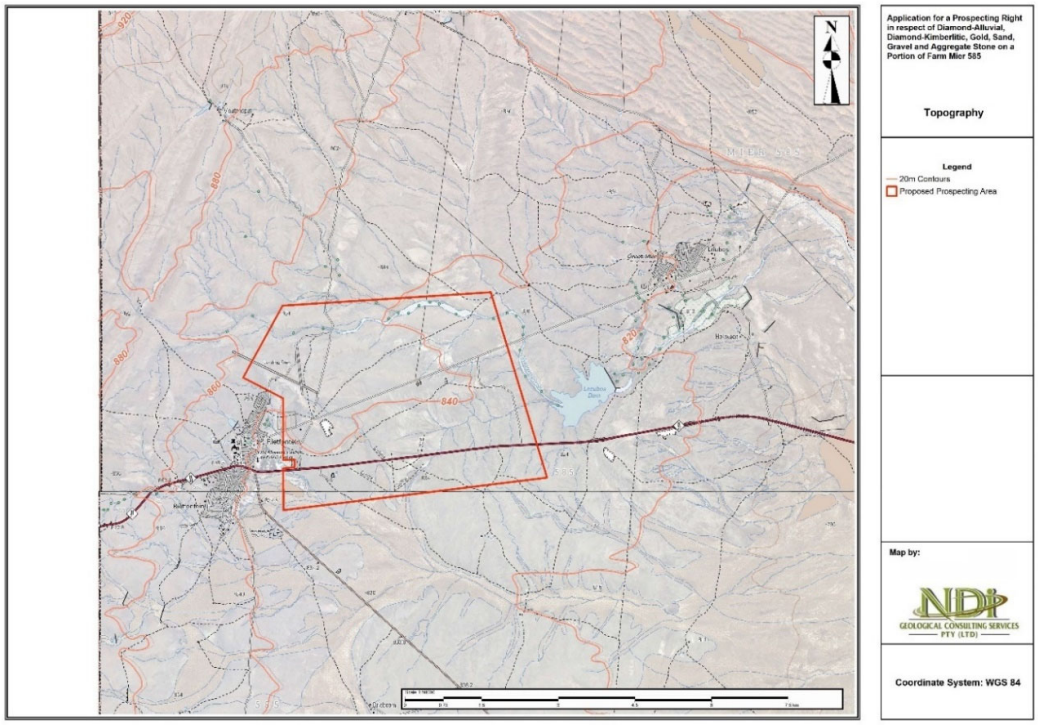



**Figure 10-7: Topography**

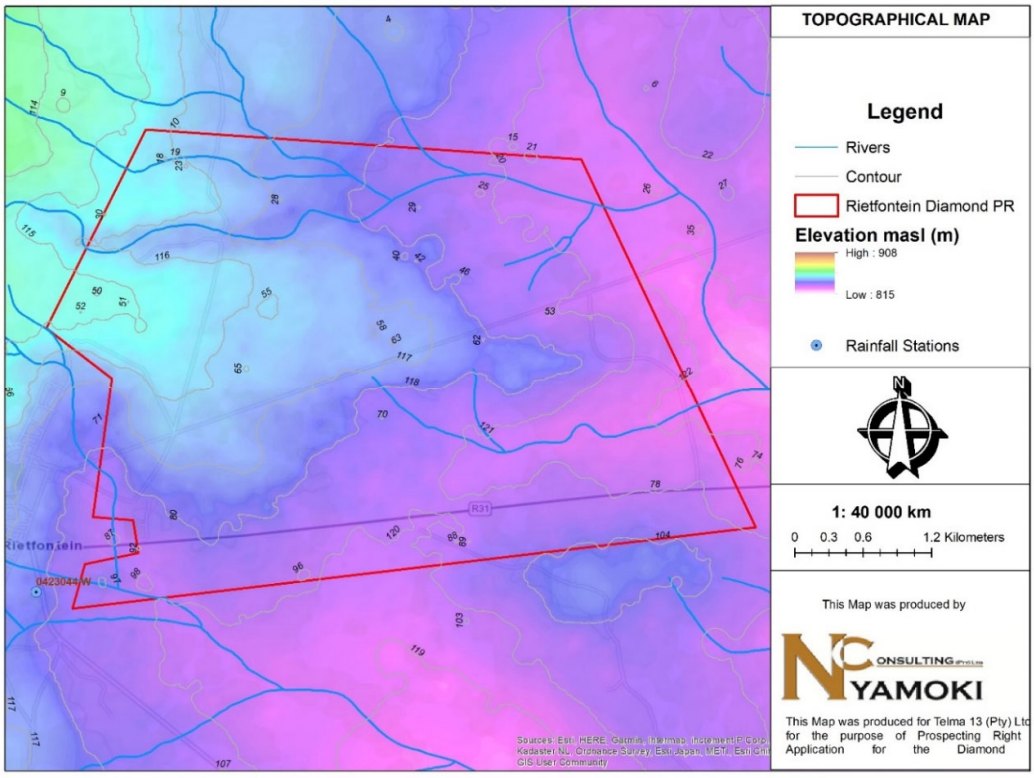
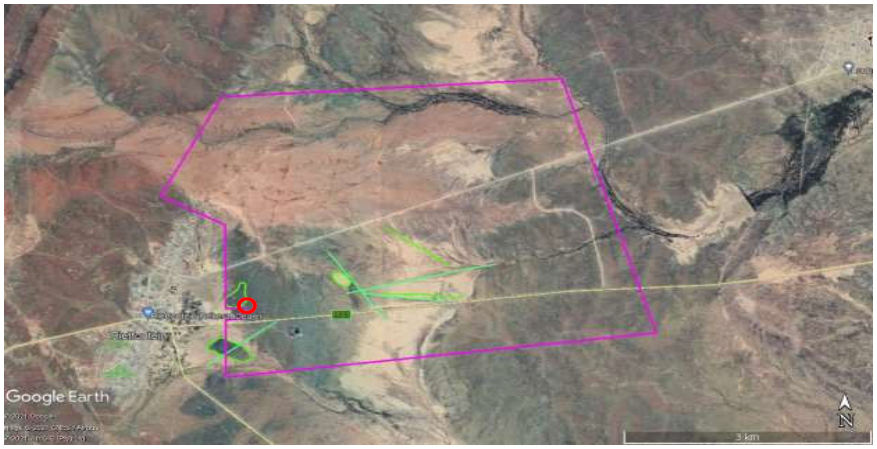



**Figure 10-8: Topographical map**

## 10.4 Geology

The project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting (Figure 10-9).

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KIMBERLITE LIKE ANOMALITIES

**Figure 10-9: Kimberlite-like anomalies are highlighted in green.**

Few fragments of severely weathered kimberlite were collected during site visit within project area (within red circle on Figure 10-9). This confirms kimberlite presence within target area.

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FRAGMENT OF SEVERELY WEATHERED KIMBERLITE BRECCIA

**Picture 10-1: Fragment of severely weathered kimberlite breccia**

Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous.

Gravels moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades.

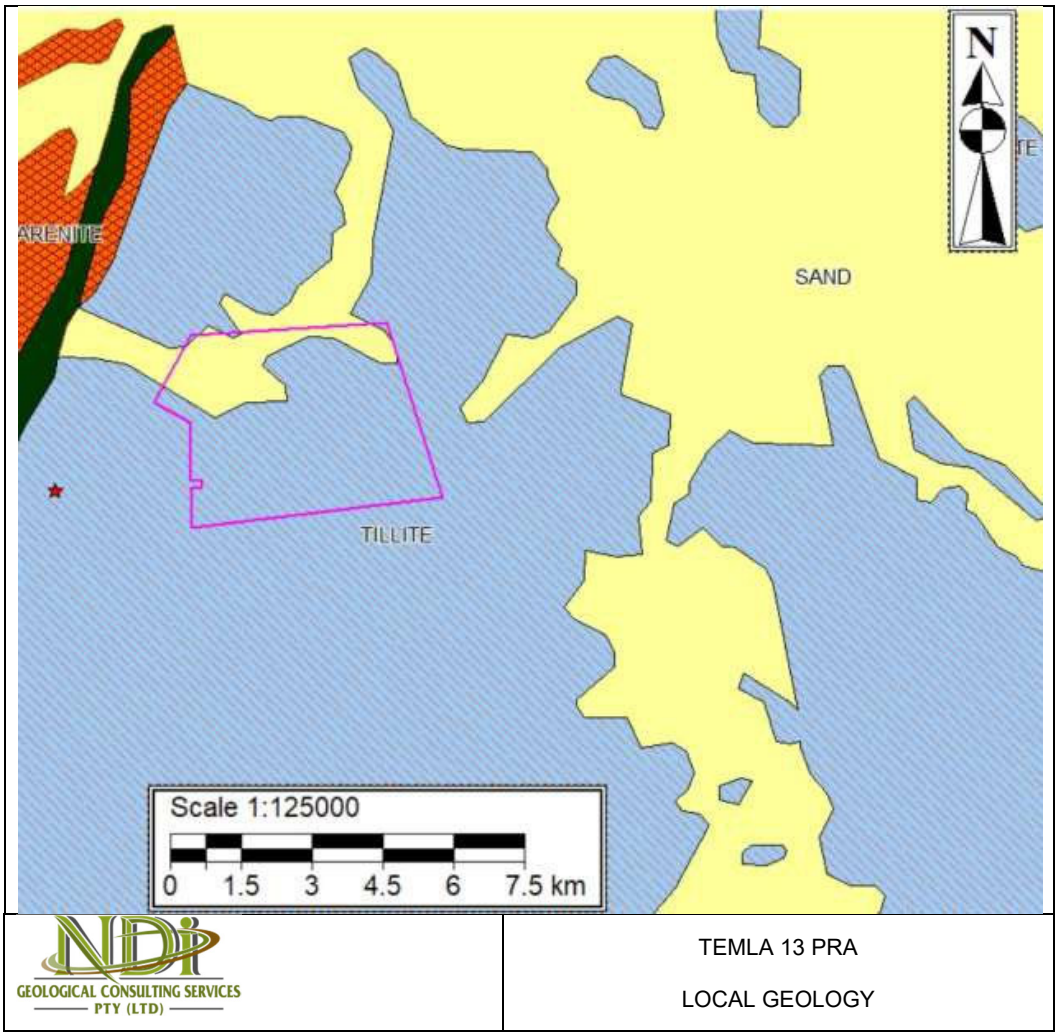



**Figure 10-10: Geology of the application area and its surroundings**

## 10.5 Current Land Use and land capability

The current landuse on the affected properties is agriculture. It is expected that due to the low rainfall and high temperatures and evapotranspiration, the agriculture potential of the area is low.

There is also a residential area (Rietfontein) located less than 1km from the proposed prospecting area. Figure 10-11 provides a map showing landuses associated with the prospecting right area.

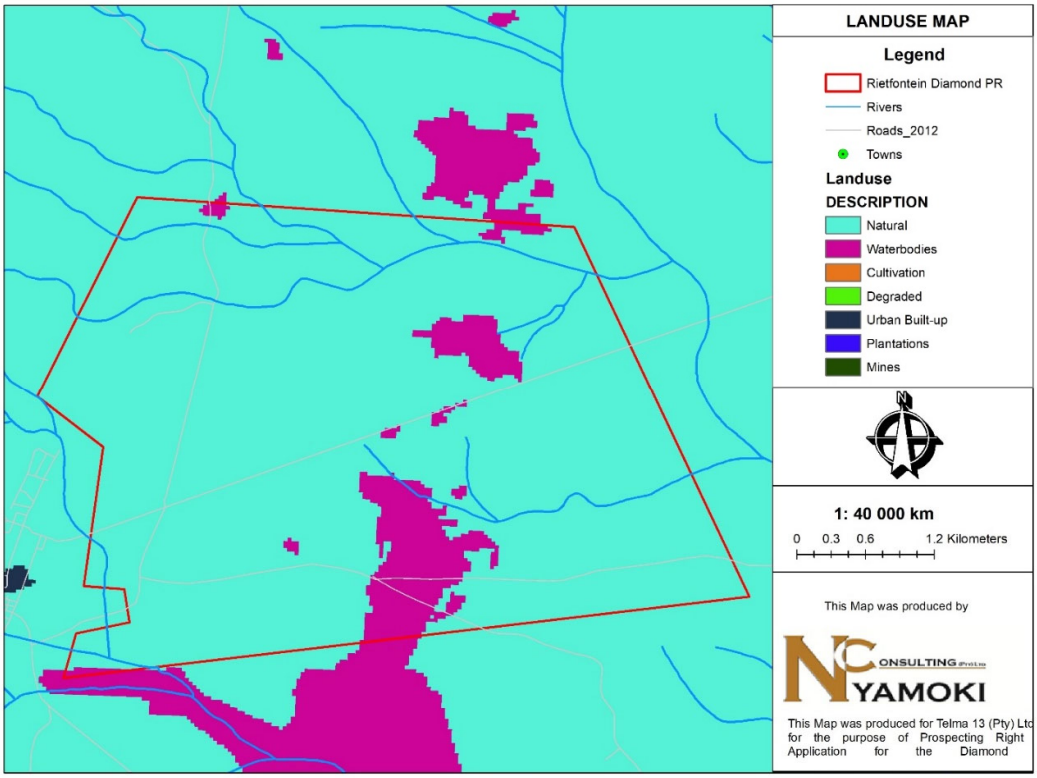



**Figure 10-11: Landuse map**

## 10.6 Biodiversity

### 10.6.1 Biomes

The proposed prospecting area is located in the Nama-Karoo Biome (Figure 10-12). The Nama-Karoo flora is not considered particularly rich and does not contain any centre of endemism. The local endemism of the biome is very low compared to other biomes.

The Nama-Karoo is a complex of extensive plains, dominates by low (dwarf) shrubs, intermixed with grasses, succulents, geophytes, and annual forbs. Small trees occur only along drainage lines or on rocky outcrops.

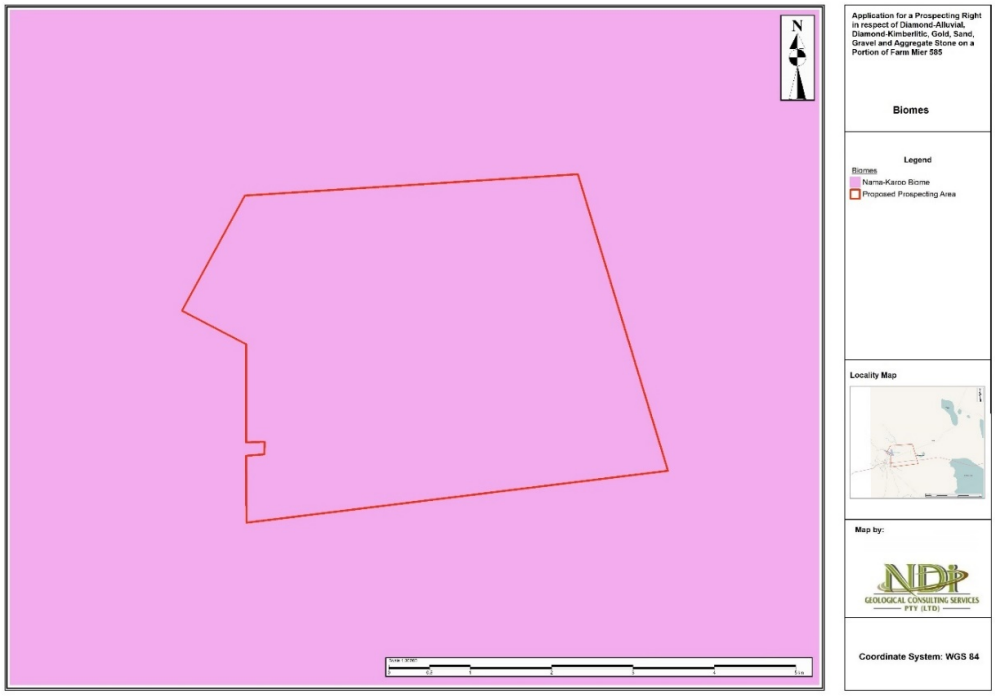



**Figure 10-12: Biomes**

## 10.6.2 Bioregions

The proposed prospecting area is located in the Bushmanland Bioregion (Figure 10-13). The Bushmanland Bioregion occurs from the northeaster part of the Namaqualand area in the west to around Prieska in the east and from around Upington in the north to the Brandvlei/Sak River vicinity in the south.

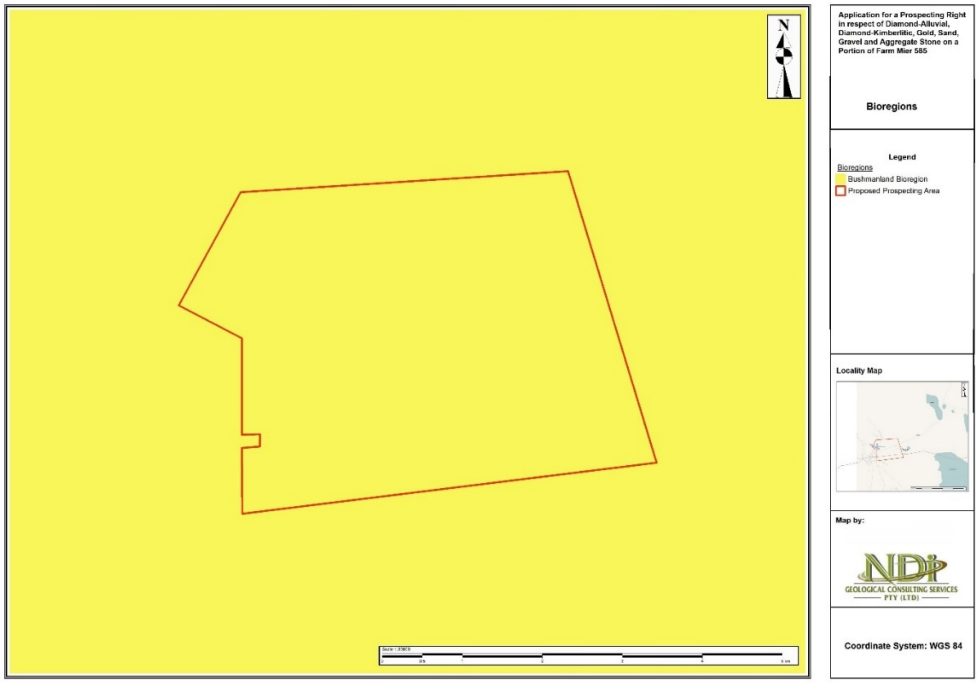



**Figure 10-13: Bioregions**

### 10.6.3 Threatened Ecosystems and Natural Vegetation

According to the SANBI database, there are no remaining natural vegetation in the proposed project area.

The prospecting area is located within the Kalahari Karroid Shrubland (Figure 10-14). The Kalahari Karroid Shrubland is characterised by low karroid shrubland on flat, gravel plains. Karoo-related elements (shrubs) meet here with northern floristic elements, indicating a transition to the Kalahari region and sandy soils.

It is distributed within the Northern Cape Province where it typically forms belts alternating with belts of Gordonia Duneveld on plains northwest of Upington through Lutzputs and Noenieput to the Rietfontein/Mier area in the north. Other patches occur around Kakamas and north of Groblershoop. The vegetation unit is formed on Cenozoic Kalahari Group sands. Small patches of Kalahari Karroid Shrubland also occur on calcrete outcrops and screens on scarps of intermittent rivers (mekgacha). In places Dwyka Group tillites form outcroppings.

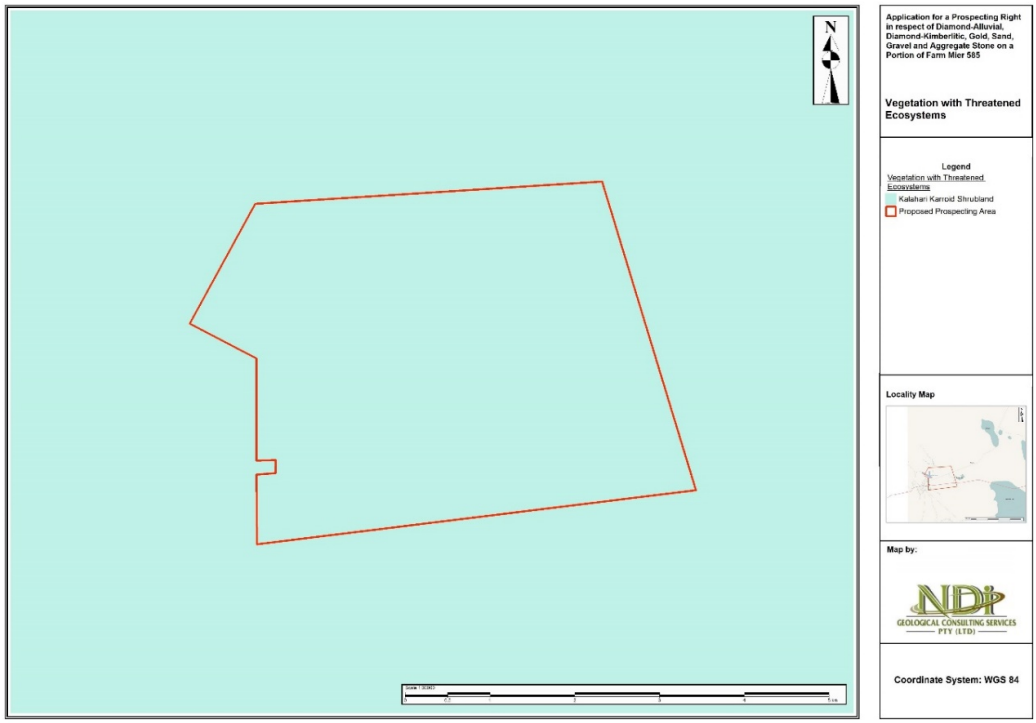



**Figure 10-14: Vegetation with Threatened Ecosystems**

Kalahari Karroid Shrubland is considered least threatened as shown in Figure 10-15, with a target conservation total of 21 %. Very little of the unit is statutorily conserved, mostly within the Augrabies Falls National Park. Although only a small area has been transformed many of the belts of this type were preferred routes for early roads, thus promoting the introduction of alien plants (about a quarter of the unit has scattered Prosopis species). Erosion is very low (94%).

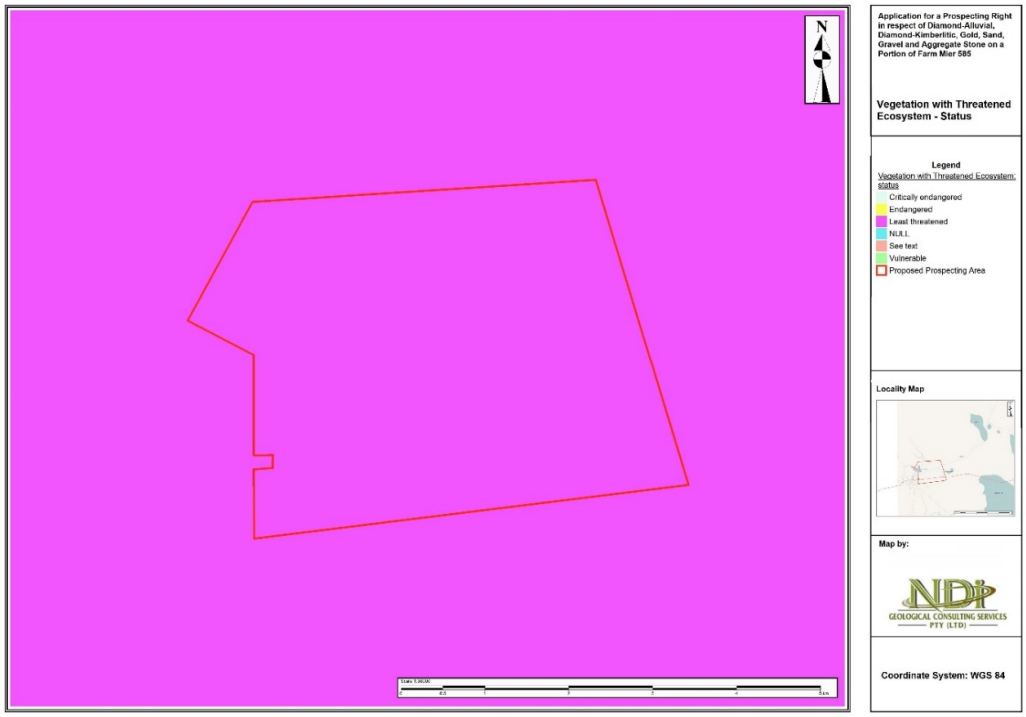



**Figure 10-15: Vegetation with Threatened Ecosystems Status**

A full list of the most important plant species found onsite are outlined in Table 10-2.

**Table 10-2: Important Taxa within the Kuruman Mountain Bushveld (Mucina and Rutherford 2006)**

| PLANT FORM | SPECIES |
|---|---|
| Small Trees | *Acacia mellifera subsp. deti¬nens (d), Parkinsonia africana (d), Boscia foetida subsp. foetida.* |
| Tall Shrub: | *Rhigozum trichotomum (d).* |
| Epiphytic Semi parasitic Shrub | *Tapinanthus oleifolius* |
| Low Shrubs | *Hermannia spinosa (d), Limeum aethiopicum (d), Phaeoptilum spinosum (d), Aizoon schellenbergii, Aptosimum albomarginatum, A. lineare, A. marlothii, A. spinescens, Barleria rigida, Hermannia modesta, Indigofera heterotricha, Leucosphaera bainesii, Monechma genistifolium subsp. genistifolium, Phyllanthus maderaspatensis, Polygala seminuda, Ptycholobium biflorum subsp. biflorum, Sericocoma avolans, Solanum capense, Tephrosia dregeana. Herbs: Dicoma capensis (d), Chamaesyce inaequilatera (d), Amaranthus praetermissus, Barleria lichtensteiniana, Chamaesyce glanduligera. Chascanum garipense, Cleome angustifolia subsp. diandra, Cucumis africanus, Geigeria ornativa, Hermannia abrotanoides, Indigastrum argyraeum, Indigofera alternans, I. auricoma, Kohautia cynanchica, Limeum argute-carinatum, Mollugo cerviana, Monsonia umbellata, Sesamum capense, Tribulus cristatus, T. pterophorus, T. terrestris. Succulent Herbs: Gisekia africana, G. pharnacioides, Trianthema parvifolia. Graminoids: Aristida adscensionis (d), Enneapogon desvauxii (d), E. scaber (d), Stipagrostis obtusa (d), Aristida congesta, Enneapogon cenchroides, Eragrostis annulata, E. homomalla, E. porosa, Schmidtia kalahariensis, Stipagrostis anomala, S. ciliata, S. hochstetteriana, S. uniplumis, Tragus berteronianus, T. racemosus.* |

### 10.6.4 Flora

According to the biodiversity assessment:

- The natural veld encountered on site can be described as a sparse karroid-type vegetation on a very rocky substrate. The vegetation structure is that of a hardy drought resistant shrubland (apart from single *Prosopis* trees next to some of the seasonal streams) (Picture 10-2). Species diversity was low but very homogeneous, dominated by a combination of the following: *Rhigozum trichotomum* (forming only a low shrub), *Thesium lineatum*, *Acacia hebeclada, Kleinia longiflora, Monechma* species, *Hermannia* species (no flowers), *Aptosimum spinescens, Geigeria filifolia, Blepharis mitrata* and *Ziziphus mucronata* (occasionally near seasonal streams) (Picture 10-3).

**Picture 10-2: Thornveld tree onsite**

**Picture 10-3: Species along the drainage lines and wetlands area**

- No floral species of special concern were observed onsite, this may be attributed to the ongoing land uses and the land transformation.
- No Plant Species with Ethnobotanical value was observed onsite during the site inspection.
- Invasive Alien Infestation: A number of *Prosopis glandulosa* (a category 2 invader) were encountered scattered on both sites. According to Regulation 15 and 16 of CARA all category 2 plants have the proven potential of becoming invasive but may have certain beneficial properties. The regulations make provisions for category 2 plants to be retained in special areas demarcated for that purpose, but those occurring outside demarcated areas must be controlled. The specialist recommends that all *Prosopis* individuals should be removed on both sites and its immediate surroundings.

### 10.6.5 Fauna

According to the biodiversity assessment:

- Mammals: According to the desktop study conducted, the species listed in Table 10-3 were identified as being possible to occur within the study area or the immediate vicinity of the prospecting right area. It must be noted that some of these species are very sensitive to habitat and in some instances; the likeliness for them to occur is minimal. There are nine Red List mammal species that have a high chance of occurring in the study area. Cattle and other domestic animals graze in the property.

**Table 10-3: Sensitive mammals that are likely to occur onsite**

| Common name | Recorded on site |
|---|---|
| Spotted necked otter | None |
| Greater dwarf shrew | None |
| Rock dormouse | None |
| Lesser grey-brown musk | None |
| African weasel | None |
| Honey badger | None |

| Common name | Recorded on site |
|---|---|
| Southern hedgehog | None |

None of the sensitive mammals which were expected were spotted on site. The presence of evidence of disturbance onsite, and the seasonality issues may explain why all the sensitive mammals were not seen during the site visit. Some of the expected animals are nocturnal, and thus may only be seen at night. The study site is located within a dam, which may attract a number of animals for drinking and feeding purposes.

- Reptiles: There are three Red List reptile species that could occur in the study area, i.e. the African rock python, the Swazi rock snake and the variegated wolk snake. All three of these have a high chance of occurring in the study area, on the basis of habitat requirements and are most likely to occur in rocky habitats, either on rocky outcrops or in rocky, well wooded valleys.

  None of the expected reptiles were observed on site during the site visit.

- Avifauna: According to the South African Bird Atlas Project (SABAP2), almost 300 species of birds have been identified in the area. All birds that could be present within the vicinity of the study area are listed in Table 10-4.

**Table 10-4: Red Data bird species potentially found within the study site**

| Scientific Name | Common Name | IUCN Status |
|---|---|---|
| *Geronticus calvus* | Southern Bald Ibis | VU |
| *Sagittarius serpentarius* | Secretary bird | NT |
| *Gyps coprotheres* | Cape Vulture | VU |
| *Stephanoaetus coronatus* | African Crowned Eagle | NT |
| *Circus ranivorus* | African Marsh-Harrier | VU |
| *Circus maurus* | Black Harrier | NT |
| *Falco biarmicus* | Lanner Falcon | LC |
| *Alcedo semitorquata* | Half Collared Kingfisher | CR |
| *Bugeranus carunculatus* | Wattled Crane | VU |
| *Anthropoides paradiseus* | Blue Crane | VU |
| *Balearica regulorum* | Grey Crowned Crane | VU |
| *Eupodotis senegalensis* | White-bellied Korhaan | VU |

A few avifaunal species were observed during the site inspection. The prospecting operation may generate noise pollution which serves as a deterrent to birds.

- Invertebrates: A list of butterflies that are likely to be observed on the study site and the surrounding areas are summarised in Table 10-5.

**Table 10-5: Butterfly species expected to occur on site.**

| Scientific Name | Common Name |
|---|---|
| *Melanitis leda Helena* | Evening Brown |
| *Acraea anemosa* | Broad-bordered Acraea |
| *Acreae neobule* | Wandering Acraea |
| *Danaus chrysippus* | African Monarch butterfly |
| *Junonia hierta cebrene* | Yellow Wetlands butterfly |
| *Danays chrysippus* | Southern Milkweed |
| *Charaxes jasius* | Koppie Emperor |

| Scientific Name | Common Name |
|---|---|
| *Cyclyrius pirithous* | Common Blue |
| *Hyalites esebria* | Dusky Acrea butterfly |
| *Phalantha aethiopica* | Poplar Leopard |
| *Alaena amazoula* | Yellow Zulu |
| *Catacroptera cloanthe* | Pirate butterfly |
| *Charaxes achaemenses* | Bushveld Emperor |
| *Pinacopteryx eriphia* | Zebra White butterfly |
| *Eurema brigitta* | Broad-bordered yellow |
| *Vanessa cardui* | Painted Lady |
| *Papilio demodocus* | Citrus Swallowtail butterfly |

No evidence of invertebrates was observed onsite.

## 10.7 Wetlands

### 10.7.1 Wetland Types

Two unchannelled valley bottom wetlands Hydrogeomorphic (HGM) 1 and HGM 2 were identified on the north of the prospecting right boundary. Unchannelled valley bottom wetlands are characterised by their location on valley floors and the absence of a channel flowing through the wetland. Four valley head seeps HGM 3, HGM 7, HGM 11 and HGM 12 were identified in the centre of the prospecting right area. Six Flat wetlands HGM 4, HGM 5, HGM 6, HGM 8 and HGM 10 were also identified within the centre of the prospecting right area, while one Depression HGM 13 was identified within the southwest of the prospecting right boundary (Figure 10-16). Dominant water inputs to these wetlands are from/into a channel, in this instance an upstream source, flowing through the wetland either as surface flows resulting from flooding or as subsurface flow. Water generally moves through the wetland as diffuse surface flow although occasionally as short-lived concentrated flows during flood events (Kotze et al., 2008; Ollis et al., 2013).

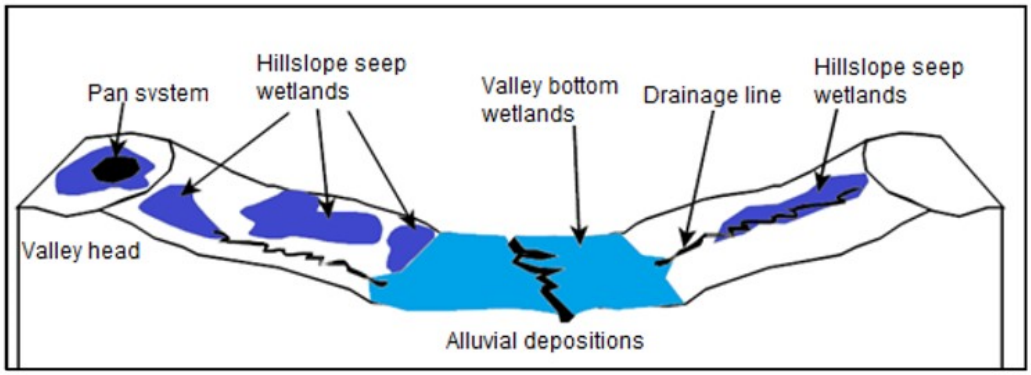



**Figure 10-16: Diagrammatic representation of common wetland systems identified in Southern Africa (based on Kotze et al., 2008)**

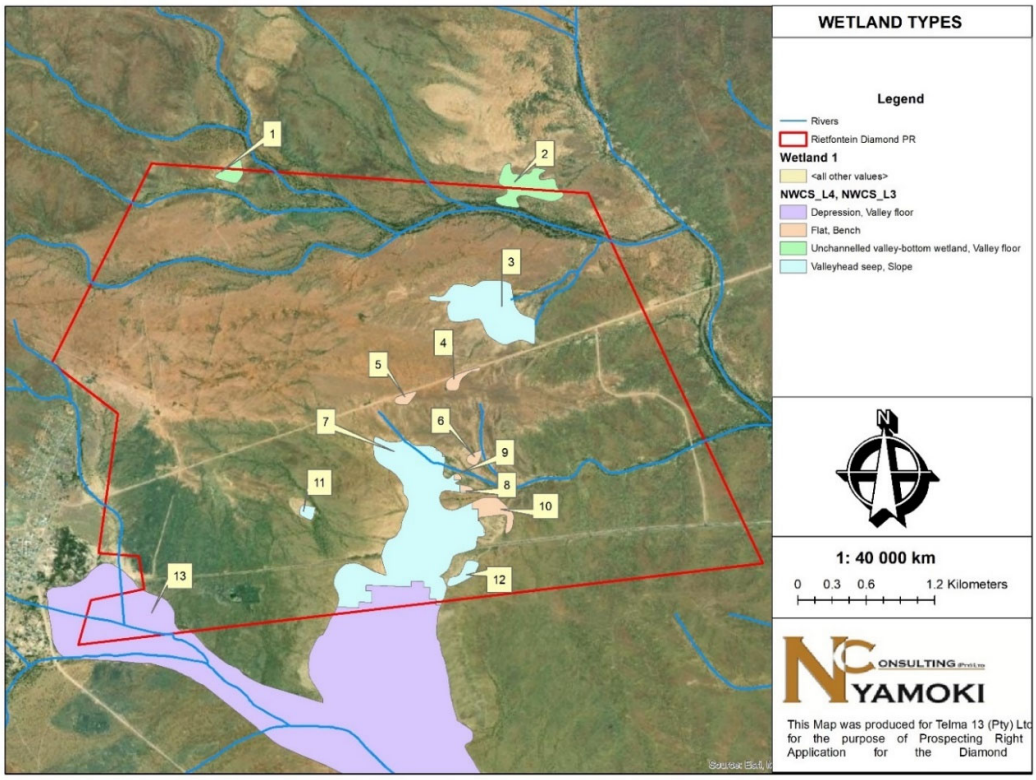



**Figure 10-17: Wetlands located on the site**

## 10.7.2 Ecological Sensitivity and Importance

The Ecological Sensitivity and Importance (EIS) of the wetlands has generally been recorded as moderate to low and the Ecological Services as intermediate (Table 10-6 and Table 10-7). Although no red-data species were identified during the site investigation, the majority of unchannelled valley bottom systems usually, provide habitat for a number of floral and faunal species.

**Table 10-6: Summary of the Ecological Services of the wetland system HGM 1 to HGM 13**

| Condensed summary sheet | HGM 1 to HGM 13 | |
|---|---|---|
| | Overall Score | Confidence rating |
| Flood attenuation | 1.5 | 2 |
| Streamflow regulation | 1.2 | 2 |
| Sediment trapping | 2 | 1.1 |
| Phosphate trapping | 2 | 1 |
| Nitrate removal | 2 | 1 |
| Toxicant removal | 2 | 1 |
| Erosion control | 1 | 2 |
| Carbon storage | 2 | 2 |
| Maintenance of biodiversity | 1 | 2 |
| Water supply for human use | 1 | 2 |
| Natural resources | 1.2 | 2 |
| Cultivated foods | 1 | 2 |
| Cultural significance | 1.5 | 2 |

| Condensed summary sheet | HGM 1 to HGM 13 | |
|---|---|---|
| | Overall Score | Confidence rating |
| Tourism and recreation | 1 | 2 |
| Education and research | 1 | 2 |
| Threats | 1 | 2 |
| Opportunities | 1 | 2 |
| **Overall** | **1.38** | **1.77** |

**Note:** <0.5 Low; 0.5-1.5 Moderately low; 1.5-2.5 Intermediate; 2.5-3.5 Moderately high; and >3.5 High

**Table 10-7: Summary of the Ecological Importance and Sensitivity of the wetland system associated with the proposed**

| Ecological Importance | Score (0-4) | Confidence (1-5) |
|---|---|---|
| **Biodiversity support** | **0.87** | **2.67** |
| Presence of Red Data species | 0.5 | 2 |
| Populations of unique species | 0.8 | 2 |
| Migration/breeding/feeding sites | 1.3 | 4 |
| **Landscape scale** | **1.54** | **3** |
| Protection status of the wetland | 1.5 | 2 |
| Protection status of the vegetation type | 2 | 2 |
| Regional context of the ecological integrity | 1.3 | 2 |
| Size and rarity of the wetland type/s present | 1.2 | 2 |
| Diversity of habitat types | 1.7 | 2 |
| **Sensitivity of the wetland** | **1.33** | **2.33** |
| Sensitivity to changes in floods | 1.5 | 3 |
| Sensitivity to changes in low flows/dry season | 1.2 | 2 |
| Sensitivity to changes in water quality | 1.3 | 2 |
| **ECOLOGICAL IMPORTANCE & SENSITIVITY** | **1.25** | **2.67** |
| **HYDROLOGICAL/FUNCTIONAL IMPORTANCE** | **2.38** | **2.38** |
| **DIRECT HUMAN BENEFITS** | **1.5** | **4** |
| **OVERALL** | **1.71** | **3.01** |

None, Rating = 0 rarely sensitive to changes in water quality/hydrological regime; Low, Rating =1 One or a few elements sensitive to changes in water quality/hydrological regime; Moderate, Rating =2 some elements sensitive to changes in water quality/hydrological regime; High, Rating =3 Many elements sensitive to changes in water quality/ hydrological regime; Very high, Rating =4 Very many elements sensitive to changes in water quality/ hydrological regime

### 10.7.3 Wetland Health and Present Ecological Status (PES)

According to the functional assessment flood attenuation; sediment trapping; erosion control; the maintenance of biodiversity; and the provision of natural resources are the predominant attributes provided by these wetlands to the surrounding landscapes.

The wetlands systems were assessed in terms of health and were found to be categorised as moderately modified (Category C) (Table 10-8). Modifications to the systems and the resultant effect on the health of the wetlands are predominantly related to damming, animal farming, extensive alien invasive vegetation and erosion.

**Table 10-8: Summary of PES scores for the HGM Units associated with the prospecting area**

| Module | Impact Score | Category | Trajectory |
|---|---|---|---|
| Hydrology | 3.3 | C | ↓ |
| Geomorphology | 3.2 | C | ↓ |
| Vegetation | 3.8 | C | ↓ |
| **Overall Score** | **3.41** | **C** | ↓ |

Despite the modified nature of the wetlands they still provide a number of functions to the larger landscape, particularly with regard to flood attenuation; sediment trapping; erosion control; the maintenance of biodiversity; and the provision of natural resources (Figure 10-18).

### 10.7.4 Wetland ecoservices

WET-EcoServices (Kotze et al. 2004) is a tool for evaluating the services provided by a watercourse, allowing for more informed planning and decision-making. In general, the riverine wetland provides low-moderate ecosystem services (spider diagram right). Because of the destruction of natural vegetation and the resulting loss of habitat for insects and amphibians, it has a low species richness and biodiversity (Figure 10-18)

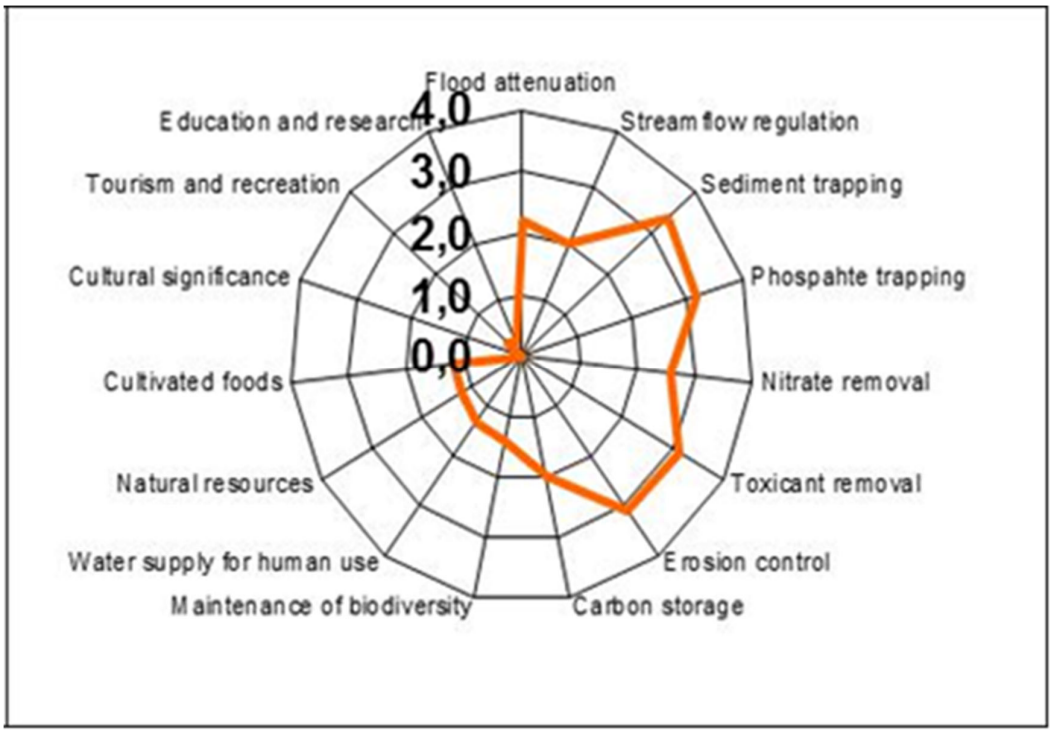



**Figure 10-18: Eco services**

## 10.8 Areas of Conservation Importance

### 10.8.1 C-Plan

The Northern Cape Provincial Biodiversity Conservation Plan classifies portions of the prospecting area as being Critical Biodiversity Areas (CBAs) 1 and 2 (*CBAs are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in*

*a systematic biodiversity plan*) and the remaining areas as Other Natural Areas (ONA) (Figure 10-19).

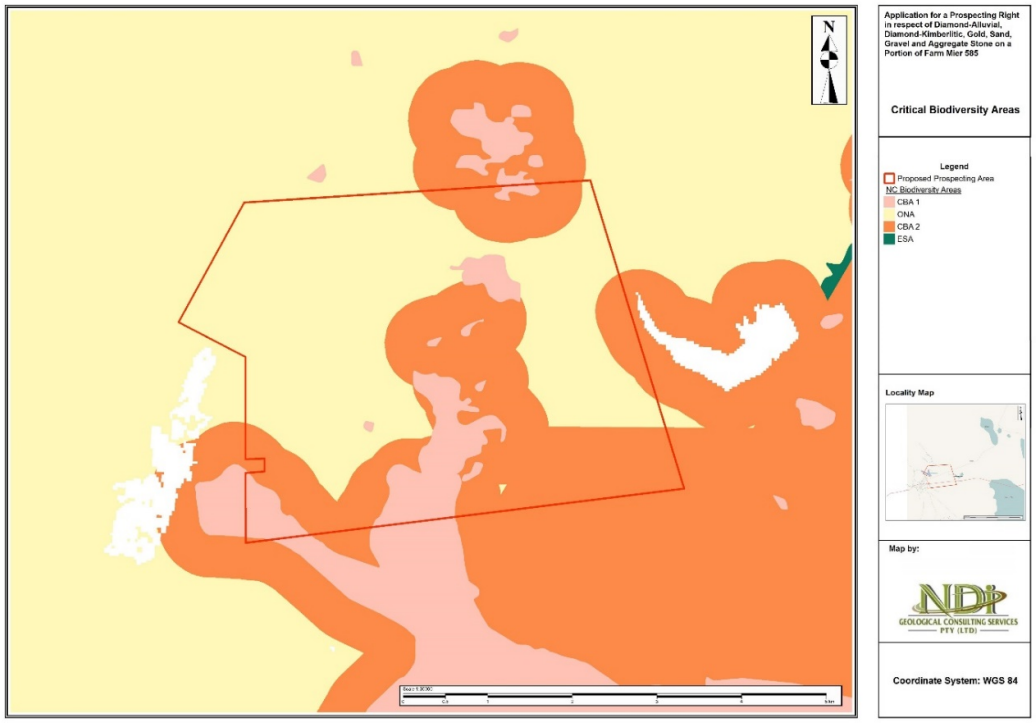



**Figure 10-19: Critical Biodiversity Areas (CBAs)**

## 10.8.2 Protected Areas

There are no protected areas or important bird areas affected by the proposed prospecting activities. The Kalahari Gemsbok Park is located approximately 60km to the north of the prospecting area as shown in Figure 10-20.

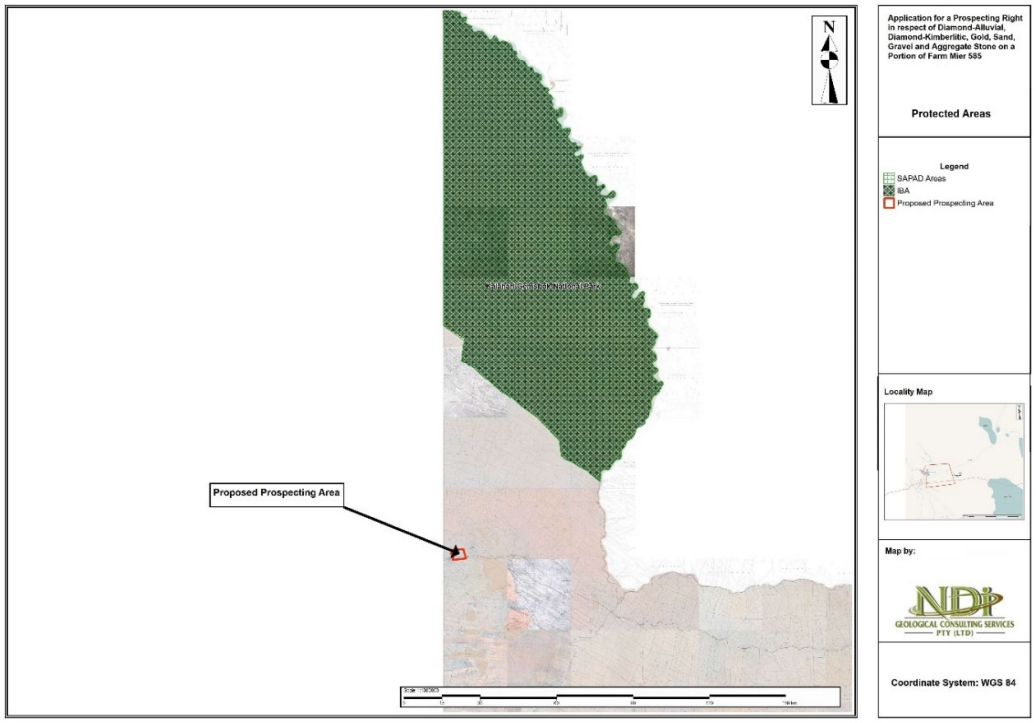



**Figure 10-20: Protected Areas**

## 10.9 Ambient Noise

A noise impact assessment was undertaken as a specialist study. The assessment included ambient noise measurements The methods for measurement and rating of environmental noise were carried out in accordance with South African National Standards (SANS) 10103:2008, which provides a guideline on how environmental noise measurements are to be taken and analysed. The standard outlines the rating levels recommended for different districts. The rural district was utilised for this assessment of the noise monitoring, mainly because the receptor points are located within a rural undeveloped area. Rural district thresholds are outlined below. It is imperative to note that the project itself may be categorised within the industrial district as it is an activity of that nature. However, due to its location, the prospecting project will be measured against the rural districts' thresholds (of 45dBA and 35dBA for daytime and night-time respectively) as outlined in Table 10-9.

**Table 10-9: Thresholds for various districts**

| Type of District | Equivalent Continuous Rating Level ($L_{Req, T}$) for Outdoor Noise | |
|---|---|---|
| | Daytime $L_{Req, d}$[(a)] (dBA) | Night-time $L_{Req, n}$[(b)] (dBA) |
| Rural districts | 45 | 35 |
| Suburban districts with little road traffic | 50 | 40 |
| Industrial districts | 70 | 60 |

### 10.9.1 Day Time Ambient Noise Monitoring Results

The results from the daytime ambient noise monitoring are provided in Table 10-10 and presented in are presented in Figure 10-21 and Figure 10-22.

**Table 10-10: Daytime Monitoring Results**

| Monitoring Point | Guideline Limit LAeq, T | Monitored Result LAeq, T |
|---|---|---|
| RT1 | 45 | 30.2 |
| RT2 | 45 | 41.2 |
| RT3 | 45 | 30.6 |
| RT4 | 45 | 43.3 |
| RT5 | 45 | 34.8 |
| RT6 | 45 | 56.1 |
| RT7 | 45 | 35.2 |
| RT8 | 45 | 41 |

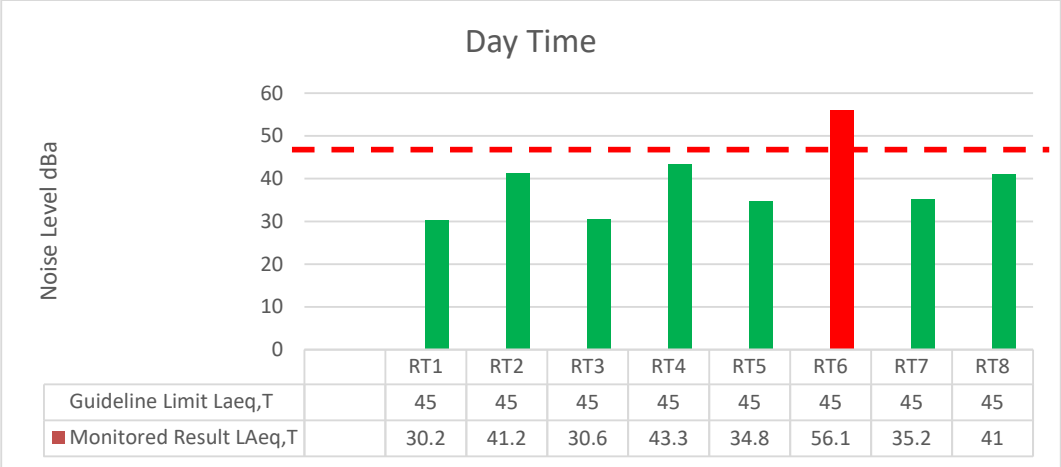



**Figure 10-21: Day-time graphical presentation**

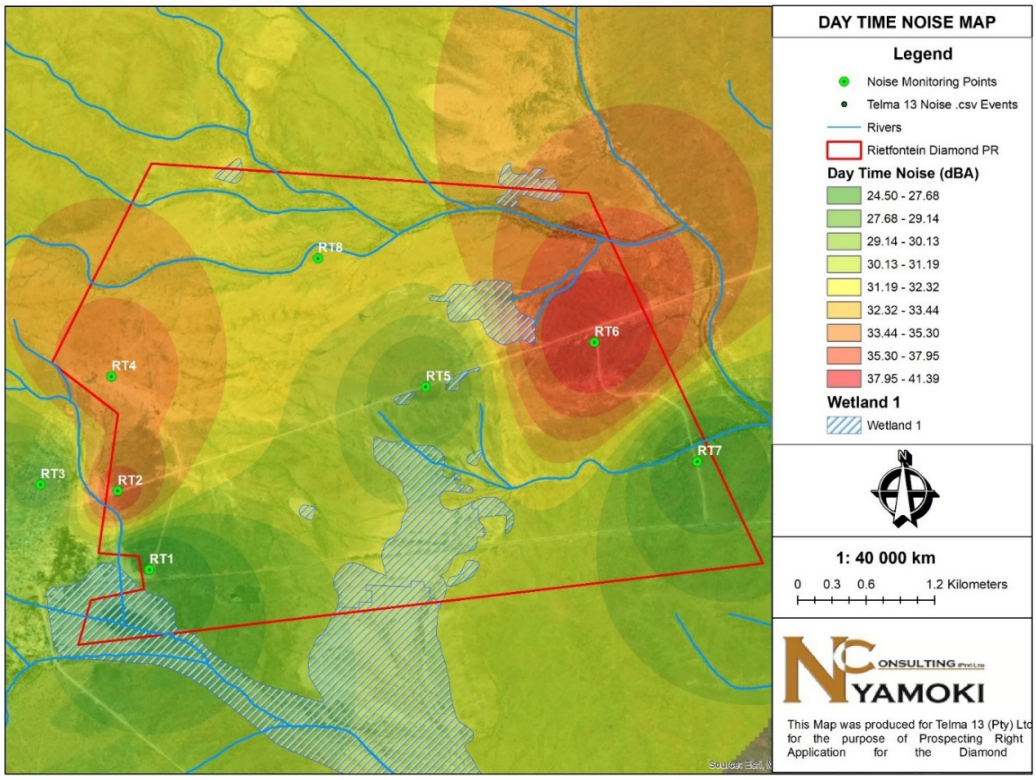


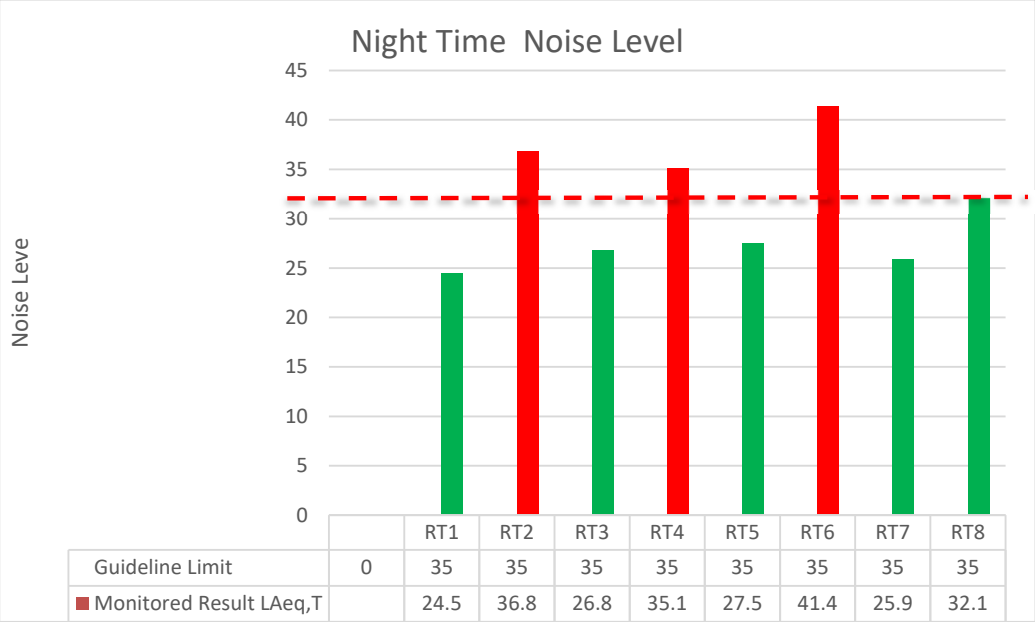

**Figure 10-22: Day Time Noise model output**

## 10.9.2 Night-time Ambient Noise Monitoring Results

The results from the night-time ambient noise monitoring are provided in Table 10-11 and presented in are presented in Figure 10-23 and Figure 10-24.

**Table 10-11: Night-time Monitoring Results**

| Monitoring Point | Guideline Limit LAeq, T | Monitored Result LAeq, T |
|---|---|---|
| RT1 | 35 | 24.5 |
| RT2 | 35 | 36.8 |
| RT3 | 35 | 26.8 |
| RT4 | 35 | 35.1 |
| RT5 | 35 | 27.5 |
| RT6 | 35 | 41.4 |
| RT7 | 35 | 25.9 |
| RT8 | 35 | 32.1 |




| | | RT1 | RT2 | RT3 | RT4 | RT5 | RT6 | RT7 | RT8 |
|---|---|---|---|---|---|---|---|---|---|
| Guideline Limit | 0 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| Monitored Result LAeq,T | | 24.5 | 36.8 | 26.8 | 35.1 | 27.5 | 41.4 | 25.9 | 32.1 |

**Figure 10-23: Night-time graphical presentation**

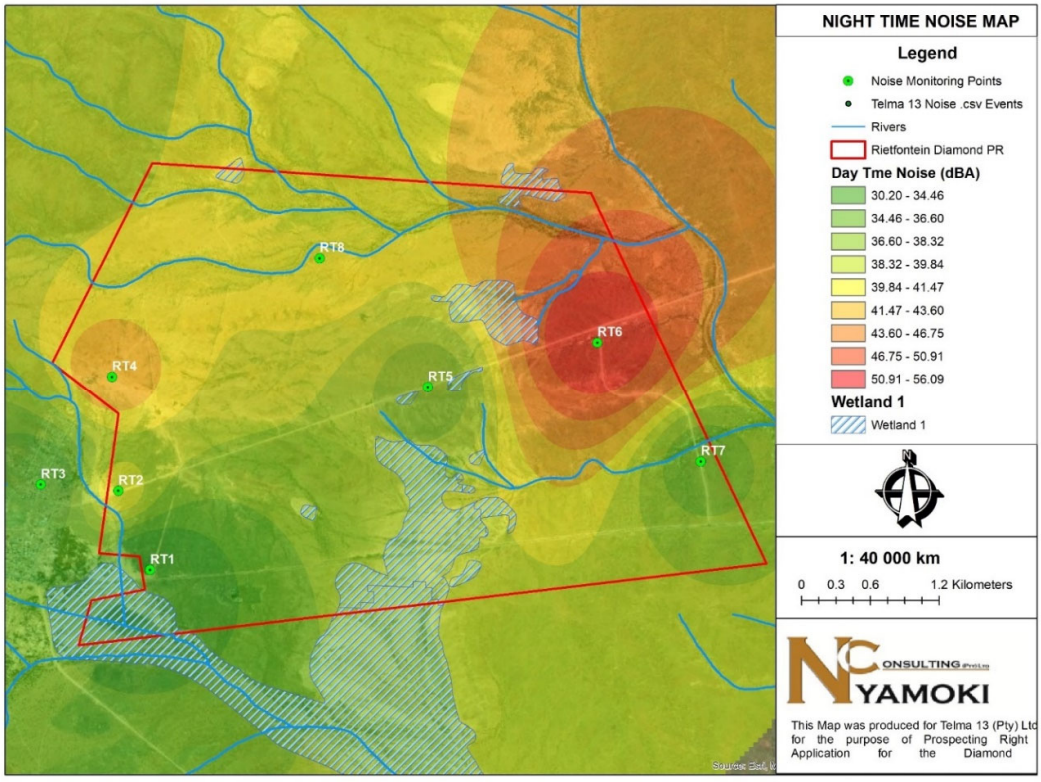



**Figure 10-24: Night-time noise level model output presentation**

## 10.10 Visual

According to the visual impact assessment, a visual impact will only occur if there are sensitive receptors present in the area to observe or experience the impact. The desktop and field assessment found that the prospecting right activity is situated within a remote area, where there is a very limited number of receptors present adjacent to the Rietfontein Community

(Figure 10-25). Furthermore, the processing plant and roadway are considered moderately sensitive receptors although workers within the prospecting right area they will have a limited view time of the surroundings.

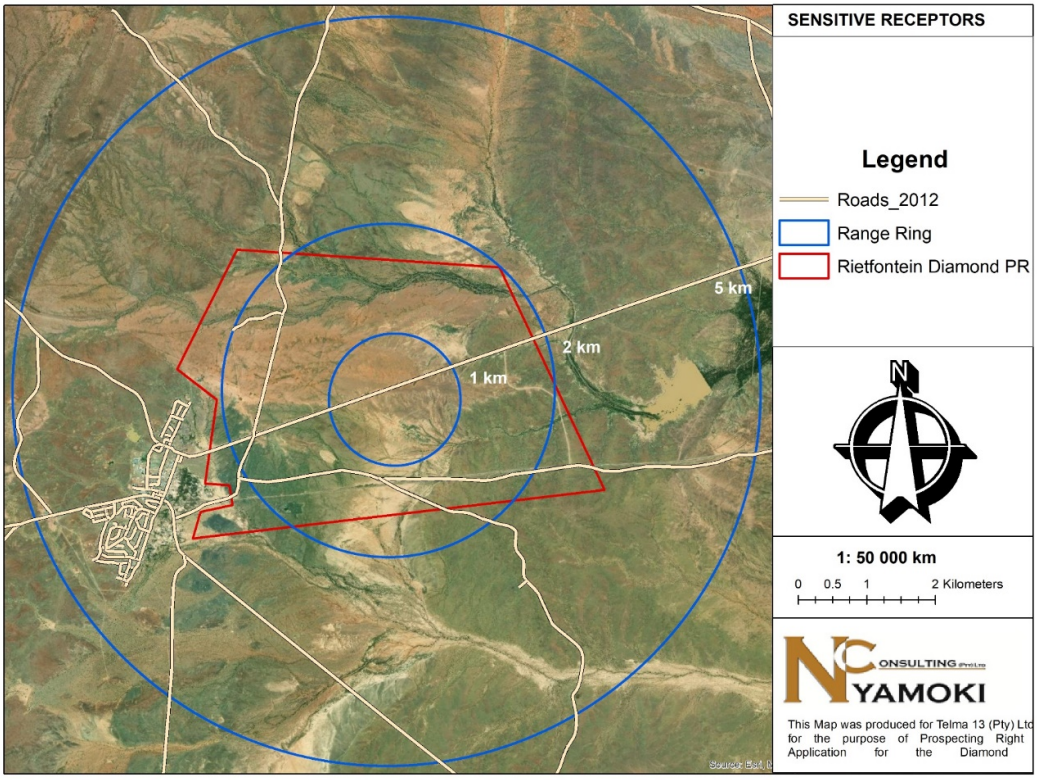



**Figure 10-25: Sensitive receptors within 5km of the proposed prospecting area.**

## 10.11 Heritage Resources

Heritage resources may be tangible, such as buildings and archaeological artefacts or intangible such as landscapes and living heritage. Their significance is based upon their aesthetic, architectural, historical scientific, social, spiritual, linguistic economic or technological values; their representation of a particular period; their rarity and their sphere of influence. There are a number of heritage and cultural resources in the Northern Cape Province.

A site-specific Phase 1 HIA was conducted as part of this impact assessment phase. A summary of the findings from the assessment is provided in Table 10-12.

**Table 10-12: Summary of Findings**

| No | Site Name | Site | Description | Co-ordinates | Mitigation measure |
|---|---|---|---|---|---|
| 1 | AS1 | Scatter of lithic tools | Isolated finds from eroded sections of the site | 26°44'37.11"S 20°02'21.67"E | Low significance, No need for mitigation |
| 2 | BS01 | Burial site | Large village cemetery with more than 200 graves | 26°44'42.56"S 20°02'18.18"E | No-go area. Provide 100m buffer zone. |

The location of the identified resources is shown in Figure 10-26.

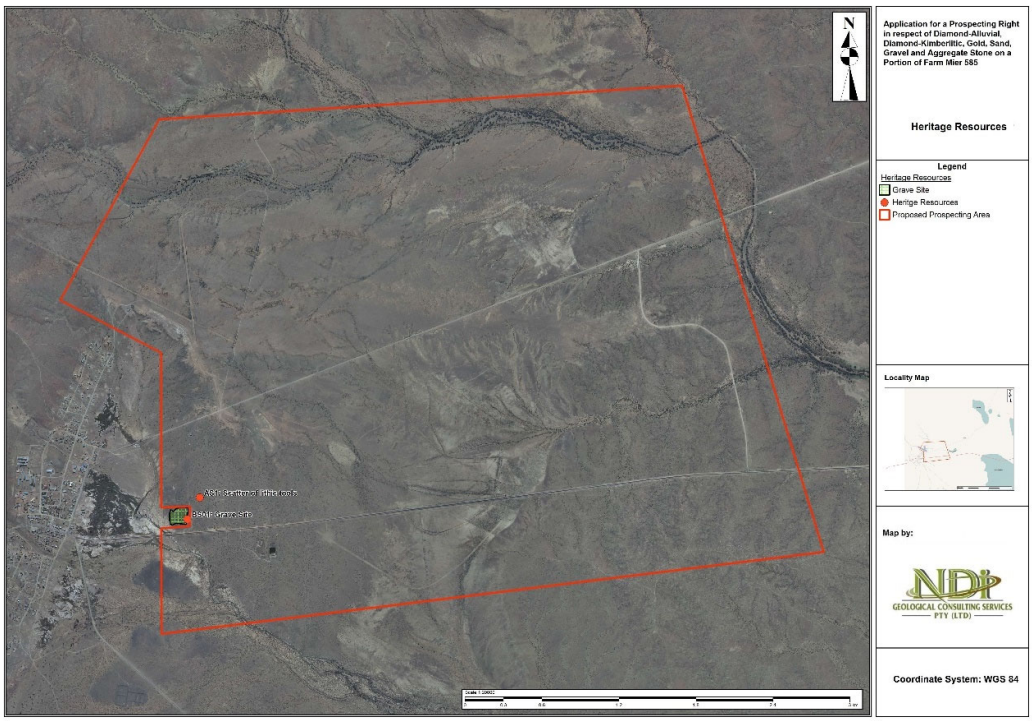



**Figure 10-26: Heritage Resources**

## 10.11.1 Archaeology

The study identified isolated lithic tools mainly occurring on eroded sections of the study site (Picture 10-4 and Picture 10-5). The lithic tools were probably washed from their original sites as such they lack provenance. Based on the field study results and field observations, the receiving environment for the proposed prospecting site is low to medium potential to yield previously unidentified archaeological sites during prospecting. Literature review also revealed that no Stone Age sites are shown on a map contained in a historical atlas of this area. This, however, should rather be seen as a lack of research in the area and not as an indication that such features do not occur.

**Picture 10-4: Lithic tools picked from eroded sections of the proposed prospecting site**

**Picture 10-5: Isolated core identified within the proposed prospecting site**

### 10.11.2 Burial grounds and Graves

The field survey identified one cemetery within the proposed prospecting site (Picture 10-6 and Picture 10-7). The cemetery caters for Rietfontein residents, and it is well known. It has more than 200 graves which are marked by oval shaped stone piles, tombstones and inscribed headstones, brick lining and cement plaster. It is the considered opinion of the author that the cemetery can be safely avoided during prospecting. The prospecting planners must ensure that they provide for a 100m buffer zone from the identified burial site. The possibility of encountering previously unidentified burial sites is low within the proposed prosecting site, however, should such sites be identified during prospecting, they are still protected in terms of Section 36 of NHRA.

**Picture 10-6: Farm structures within the proposed prospecting site**

**Picture 10-7: Farm structures within the proposed prospecting site**

### 10.11.3 Public Monuments and Memorials

There are no public memorials and monuments within the proposed prospecting site. As such the Prospecting Right Application (PRA) may be approved without any further investigation and mitigation in terms of Section 27 and of the NHRA.

### 10.11.4 Buildings and Structures

There is a farm structure which was confirmed to be younger than 60 years. Based on the satellite imagery and historical maps, the farm structure is younger than 60 years old. As such, in terms of Section 34 of the NHRA the Prosecting Right Application may be approved without any further investigation and mitigation.

## 10.12 Palaeontology

A Palaeontology Impact Assessment (PIA) specialist study was undertaken as part of the impact assessment.

### 10.12.1 Outline of the geology and the palaeontology:

The geology was obtained from map 1:100 000, Geology of the Republic of South Africa (Visser 1984) and the 1:250 000 geological map of Twee Rivieren 2620 (Thomas and Thomas 1988) (Figure 10-27).

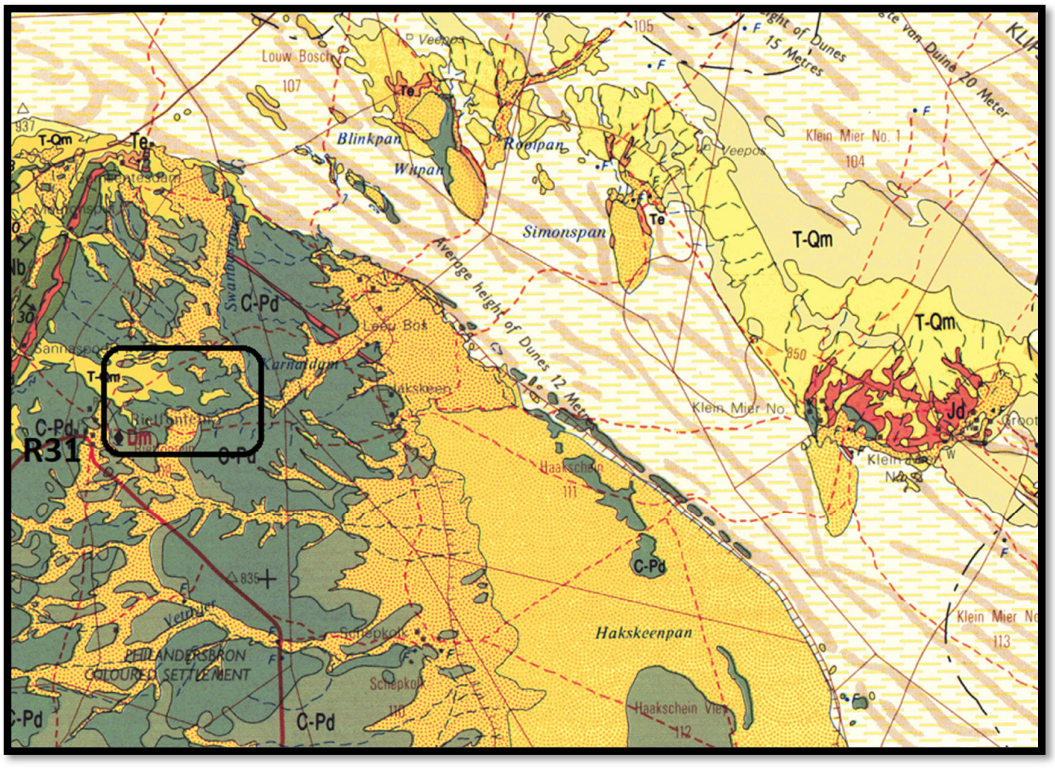



**Figure 10-27: Geology of the development area.**

Legend to Figure and short explanation.

T-Qm – Calcrete, diatomaceous in places (orange). Mokalanen Formation, Kalahari Group. Tertiary.

C-Pd – Tillite; brown ferruginous sandstone, grit, and conglomerate; impure brown limestone and calcarenite (grey). Dwyka Group, Karoo Supergroup. Carboniferous.

---f--- – (black) Fault.

……. – Undifferentiated linear structure.

⊥4º - Strike and dip.

The Demoted Syncline is to the west.

□ – Approximate position of prospecting (in black on figure).

The development is taking place on the Tertiary to Quaternary and the Karoo Supergroup. The Kalahari deposits extend in age down to at least the Late and probably the Early Tertiary (65 million years ago). Fossils are scarce and are of terrestrial plants and animals with close affinity to living forms. Included in the Kalahari Group are the Quaternary alluvium, terrace gravels, surface limestone, silcrete, and aeolian sand. Four major types of sands have been delineated (Kent 1980, Visser 1989). The alluvium sands were deposited by a river system and reworked by wind action (Snyman 1996). A thick cover of Kalahari reddish sand blankets most outcrops and is dominated by the typical Kalahari thornveld (Norman and Whitfield 2006). The Kalahari Group is underlain by the Uitenhage and Zululand Groups (McCarthy and Rubidge 2005).

The Dwyka Group is the lowermost unit of the Karoo Supergroup overlain by the Ecca Group and underlain by the Witteberg Group, Bokkeveld or Table Mountain Groups and various other groups. It ranges in age from Late Carboniferous to early Permian. Clastic rocks containing diamictite, varved shale, conglomerate, pebbly sandstone and mudrock are present. The rocks display features reflecting a glacial and glacially related origin (Kent 1980, Visser et al. 1990). Thickness varies between 100-800 m (Visser et al. 1990).

### 10.12.2 Palaeontology Baseline Characterisation

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, the palaeontological sensitivity can generally be low to very high, and here in the development high and low (SG 2.2 SAHRA APMHOB, 2012) (Almond and Pether 2009).

‘Algal microfossils’ have been reported from shales and are probably of diagenetic origin (Eriksson 1999), these are present here. Stromatolites are significant indicators of palaeoenvironments and provide evidence of algal growth between 2640 and 2432 million years ago. Significant fossil remains of Cenozoic aged terrestrial organisms have been recorded from the sedimentary rocks of the Kalahari Group. These fossils are rarely found and are allocated a high palaeontological sensitivity as they are important indicators of palaeo-environmental conditions. It is the strata below the Gordonia Formation that contains fossils (Groenewald and Groenewald 2014).

Trace fossils are relatively abundant in the shales occurring near the top of the Dwyka Group. Lycopods (*Leptophloem australe*) have been described from the northern Free State (Mac Rae 1999). Spores and acritarchs have been reported from the interglacial mudrocks of the Dwyka Group, also pollen, wood, and plant remains in the interbedded mudrocks as well as the diamictite itself, while anthropod trackways and fish trails are present in places on bedding planes (Visser *et al.* 1990). Plant fossils have been described from outcrops of the Dwyka Group in the Limpopo Province, with special reference to this group in the Springbok Flats region (Groenewald and Groenewald 2014). The Dwyka Formation is also termed the Bizane

Formation in the Free State. Trace fossils are present in KwaZulu-Natal including coprolites of fish, foraminifera, radiolariams, bryozoans, sponge spicules, starfish, nautiloids, cephalopods, bivalves, brachiopods, and palaeoniscoid fish (Groenewald 2012).

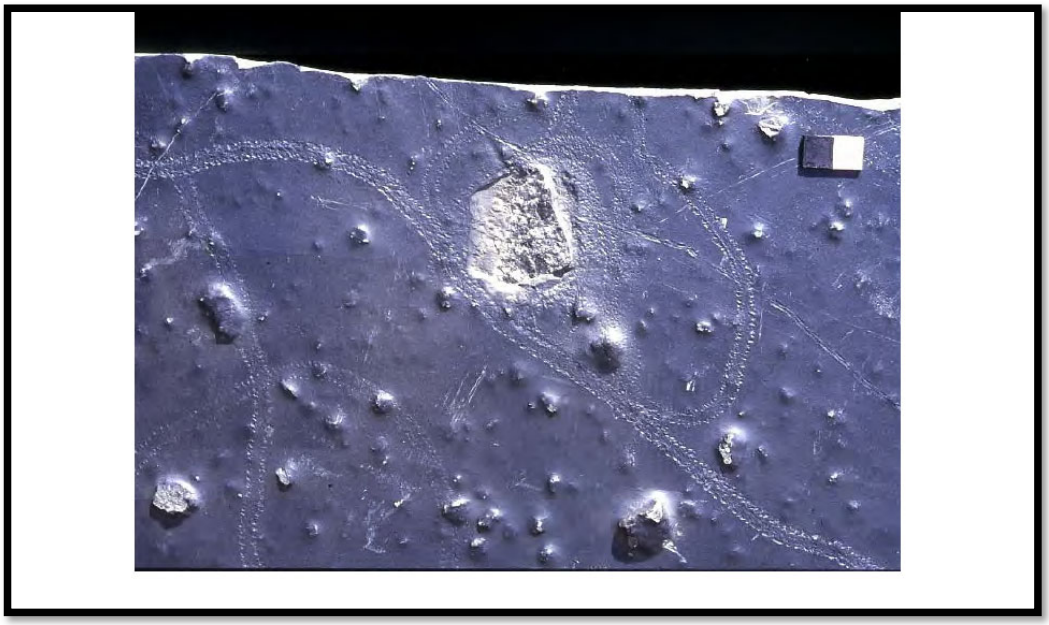


**Figure 10-28: An example of a Dwyka Group fossils (Almond and Pether 2009)**

**Table 10-13: Taken from Palaeotechnical Report (Almond and Pether 2009) (1cA, 1cB)**

| | | | |
|---|---|---|---|
| **15. FLUVIAL, LACUSTRINE & TERRESTRIAL DEPOSITS (most too small to be indicated on small scale geological maps)**<br><br>**including *eg* Kwaggaskop Fm**<br><br>**(Q)** | Fluvial, pan, lake and terrestrial sediments, including diatomite (diatom deposits), pedocretes, tufa, cave deposits<br><br>Late Cretaceous to Holocene<br>*c.* 65 Ma → 0 Ma | Bones and teeth of mammals (*eg* proboscideans, rhinos, bovids, horses, micromammals), reptiles, fish, freshwater molluscs, petrified wood, trace fossils (*eg* termitaria), rhizoliths,<br>diatom floras | • Scattered records, many poorly studied (*eg* from ancient drainage systems)<br>• Include equivalents of famous Arrisdrift Miocene fauna from S. Namibia<br>• Threatened by alluvial diamond mining (*eg* Gariep, Vaal river gravels)<br>• Orange River Man (100-50 Ka, *H. heidelbergensis*) |
| **14. KALAHARI GROUP**<br><br>**(K-Q)** | Fluvial gravels, sands, lacustrine and pan mudrocks, evaporites, aeolian sands, pedocretes (especially calcrete)<br><br>Late Cretaceous to Recent<br><90 Ma → 0 Ma | Palynomorphs, root casts (rhizomorphs) and burrows (eg termitaria), rare vertebrate remains (mammals, fish, ostrich egg shell *etc*), diatom-rich limestones, freshwater stromatolites, freshwater and terrestrial shells (gastropods, bivalves), ostracods, charophytes | Fossils mainly associated with ancient pans, lakes and river systems<br><br>Palaeontology poorly studied |
| **9. DWYKA GROUP**<br><br>**(C-Pd)** | Glacial, interglacial and post-glacial siliciclastic sediments (*eg* tillites).<br><br>Late Carboniferous – Early Permian<br>*c.* 320-290 Ma | Trace fossils, organic-walled microfossils, rare marine invertebrates (*eg* molluscs), fish, vascular plants | |

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity is generally low to very high as presented in Table 10-14.

**Table 10-14: Criteria used (Fossil Heritage Layer Browser/SAHRA)**

| Rock Unit | Significance/vulnerability | Recommended Action |
|---|---|---|
| Quaternary | High | Desktop study is required, field assessment likely |
| Kalahari Group | Low | Protocol for Chance Finds is required |
| Dwyka Group | Low | Protocol for Chance Finds is required |

According to the palaeontology assessment, the project includes one locality option with a high and low palaeontological sensitivity.

# 10.13 Geohydrology

## 10.13.1 Groundwater Yield

The proposed prospecting area is characterised by high yielding groundwater (Fractured aquifers with recharge 2.0ℓ/s to 5.0ℓ/s (Figure 10-29).

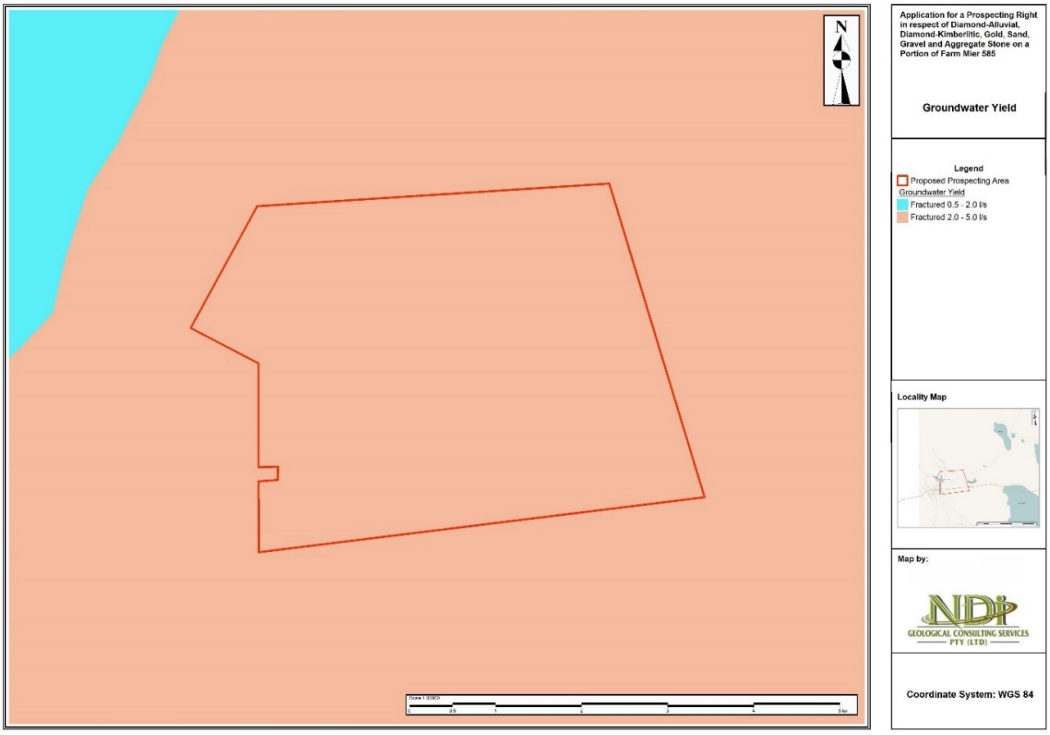



**Figure 10-29: Groundwater Yield**

## 10.13.2 Groundwater Recharge

The groundwater recharge is considered low, between 0 and 100mm/yr. (Figure 10-30). This is expected due to the dry and hot climate in the area.

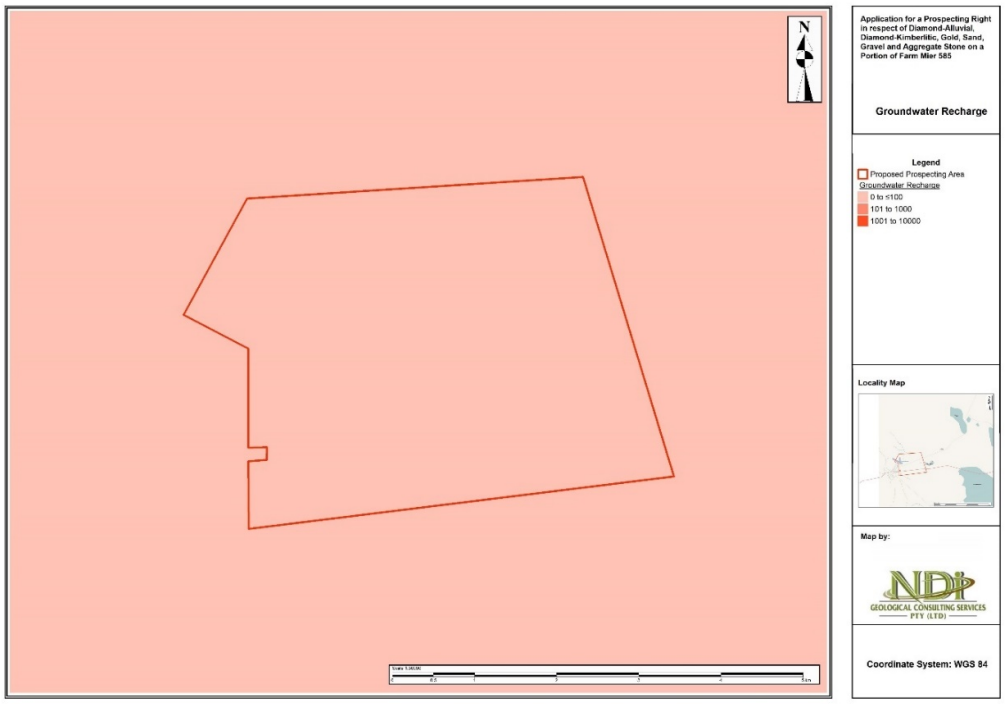



**Figure 10-30: Groundwater Recharge**

## 10.13.3 Groundwater Quality

The groundwater in the area is generally of poor quality, with Electrical Conductivity (EC) levels between 300 and 1 000 mS/m as shown in Figure 10-31. Some sections of the prosecting area have groundwater quality with EC levels >1000mS/m.


**Figure 10-31: Groundwater Quality**

### 10.13.4 Hydrocensus

According to the DWS, there are 5 boreholes within a 1km radius of the project site and 22 boreholes within the 5km radius of the site. Table 10-15 and Table 10-16 provide details of the boreholes located with the 1km and 5km radius respectively

**Table 10-15: Boreholes within 1km Radius**

| Identifier | Latitude | Longitude | Farm Name | Status | Observed Actual Water Uses |
|---|---|---|---|---|---|
| 40223 | -26.75733 | 20.03259 | Rietfontein 108 | Unused: Abandoned | Public |
| 40222 | -26.75678 | 20.03481 | Rietfontein 108 | Unused: Abandoned | |
| 38378 | -26.74094 | 20.03619 | Rietfontein 108 | Unused: Abandoned | |
| 38377 | -26.74084 | 20.02948 | Rietfontein 108 | Unused: Abandoned | |
| 38380 | -26.72194 | 20.03688 | Rietfontein 108 | Unused: Abandoned | |

**Table 10-16: Boreholes within 5km Radius**

| Identifier | Latitude | Longitude | Farm Name | Status | Observed Actual Water Uses |
|---|---|---|---|---|---|
| 38363 | -26.7605 | 20.07955 | Rietfontein 108 | In Use: Unknown | |
| 38365 | -26.77143 | 20.03597 | Rietfontein 108 | Unused: Abandoned | |
| 38368 | -26.77813 | 20.02502 | Rietfontein 108 | Unused: Abandoned | |
| 38370 | -26.79313 | 20.01931 | Rietfontein 108 | Unused: Abandoned | |
| 38372 | -26.78769 | 20.01237 | Rietfontein 108 | Unused: Abandoned | |
| 38373 | -26.78912 | 20.01962 | Rietfontein 108 | Unused: Abandoned | |
| 38377 | -26.74084 | 20.02948 | Rietfontein 108 | Unused: Abandoned | |
| 38378 | -26.74094 | 20.03619 | Rietfontein 108 | Unused: Abandoned | |
| 38380 | -26.72194 | 20.03688 | Rietfontein 108 | Unused: Abandoned | |
| 40222 | -26.75678 | 20.03481 | Rietfontein 108 | Unused: Abandoned | |
| 40223 | -26.75733 | 20.03259 | Rietfontein 108 | Unused: Abandoned | Public |
| 40224 | -26.76789 | 20.02149 | Rietfontein 108 | Unused: Abandoned | Public |
| 40225 | -26.76817 | 20.01509 | Rietfontein 108 | Unused: Abandoned | Public |
| 40226 | -26.77095 | 20.02037 | Rietfontein 108 | In Use: Unknown | Public |
| 40421 | -26.71539 | 20.11871 | Loubos 566 | In Use: Monitoring | |
| 40422 | -26.71734 | 20.12037 | Loubos 566 | In Use: Monitoring | |
| 40423 | -26.71928 | 20.11287 | Loubos 566 | In Use: Monitoring | |
| 40429 | -26.714 | 20.11147 | Loubos 566 | In Use: Monitoring | |
| 41016 | -26.76206 | 20.03062 | Rietfontein 108 | In Use: Monitoring | |
| 44960 | -26.72011 | 20.11316 | Mier 566 | In Use: Monitoring | |
| 2620CA00271 | -26.71345 | 20.11259 | Loubos 566 | Unused: Abandoned | |
| 2620CC00117 | -26.754 | 20.02067 | Rietfontein 108 | In Use: Unknown | |

Figure 10-32 and Figure 10-33 show the locations and status as well as the use of the boreholes within a 1km radius and a 5km radius.

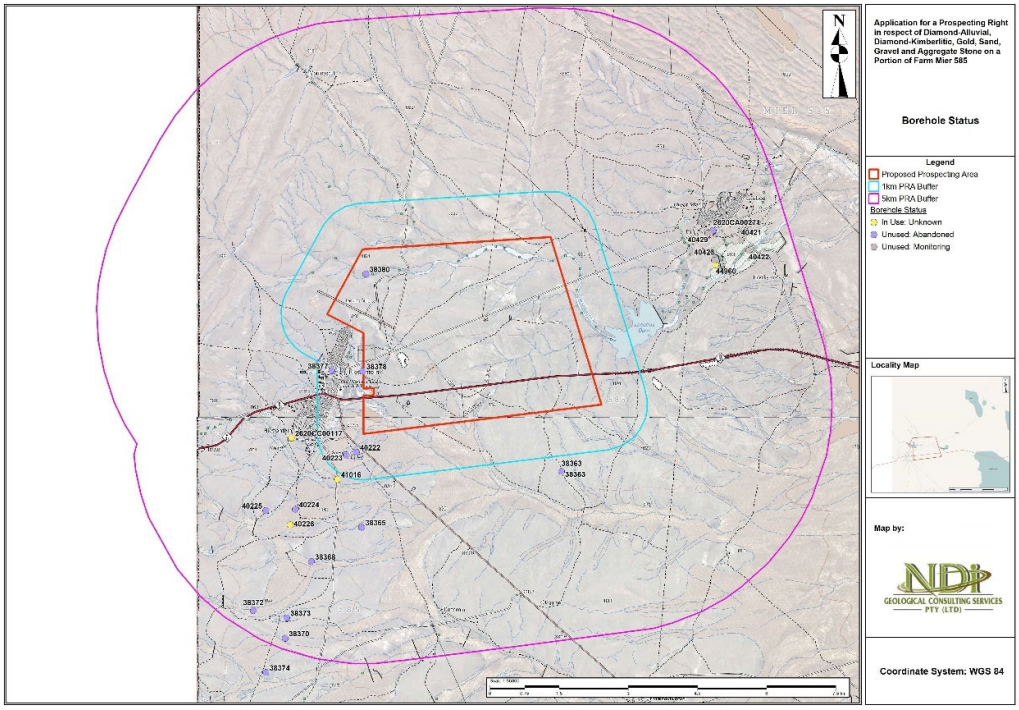



**Figure 10-32: Borehole Status**

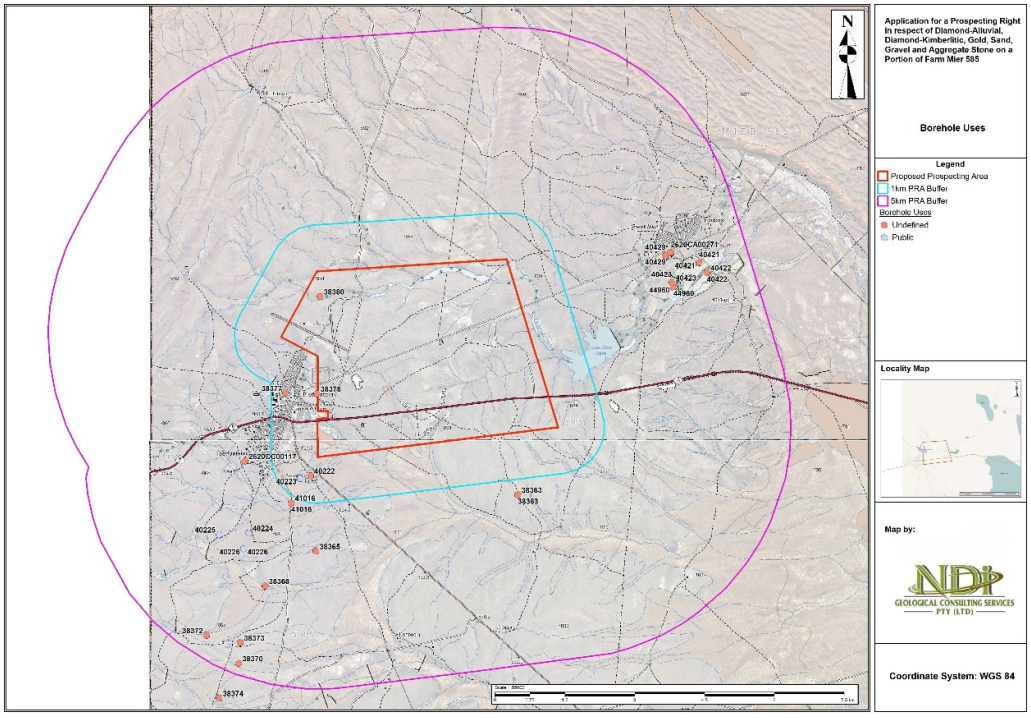



**Figure 10-33: Groundwater Uses**

# 10.14 Surface Water and Hydrology

## 10.14.1 Watercourses on Project Site

The study area is located in quaternary catchment area D42B in the Lower Orange Water Management Area (WMA) (Figure 10-34).

There are a number of rivers and tributaries that traverse the project area as shown in Figure 10-35.

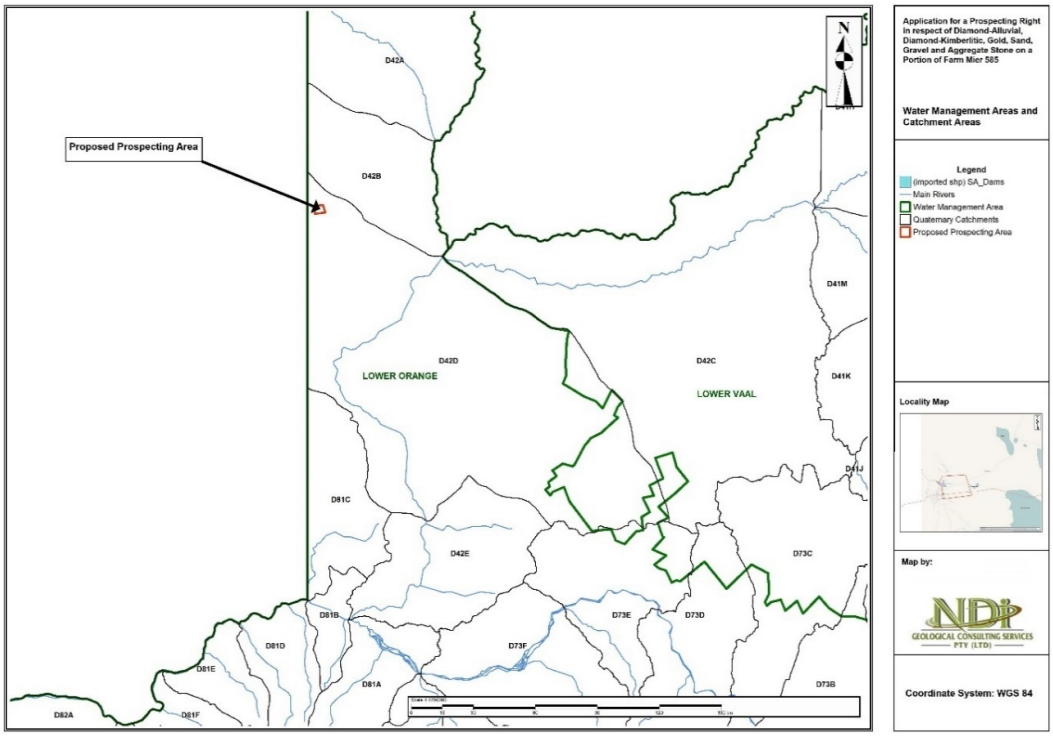



**Figure 10-34: Water Management Area and Quaternary Catchment Areas**

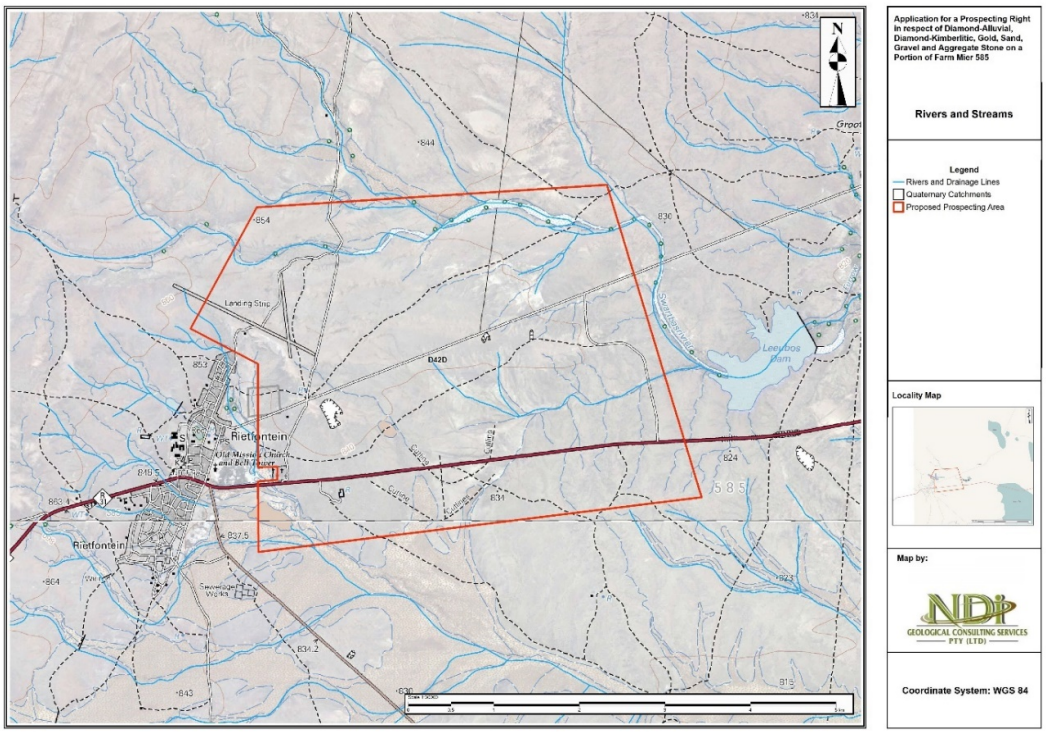



**Figure 10-35: Water Resources**

## 10.14.2 Floodline Determination

The flood line determination water undertaken to assess if the project location meets the Gazette conditions of being located more than the 1:100 flood line and 100 metres away from the watercourse. The 1:50 and 1:100-year flood line delineated and mapping for the drainage lines at the study area is given in Figure 10-36 and Figure 10-37.

The prospecting right is still a proposed activity and therefore the delineated floodlines are for planning purposes to ensure that all project activities and infrastructure are not within the floodlines. The floodlines were determined based on the catchment flood peaks estimates as provided in Table 10-17.

**Table 10-17: Catchment Flood Peak Estimates**

| Recurrence Interval (Years) | 20 | 50 | 100 |
|---|---|---|---|
| Peak Flow, Qt ($m^3/s$) | 84 | 230 | 376 |

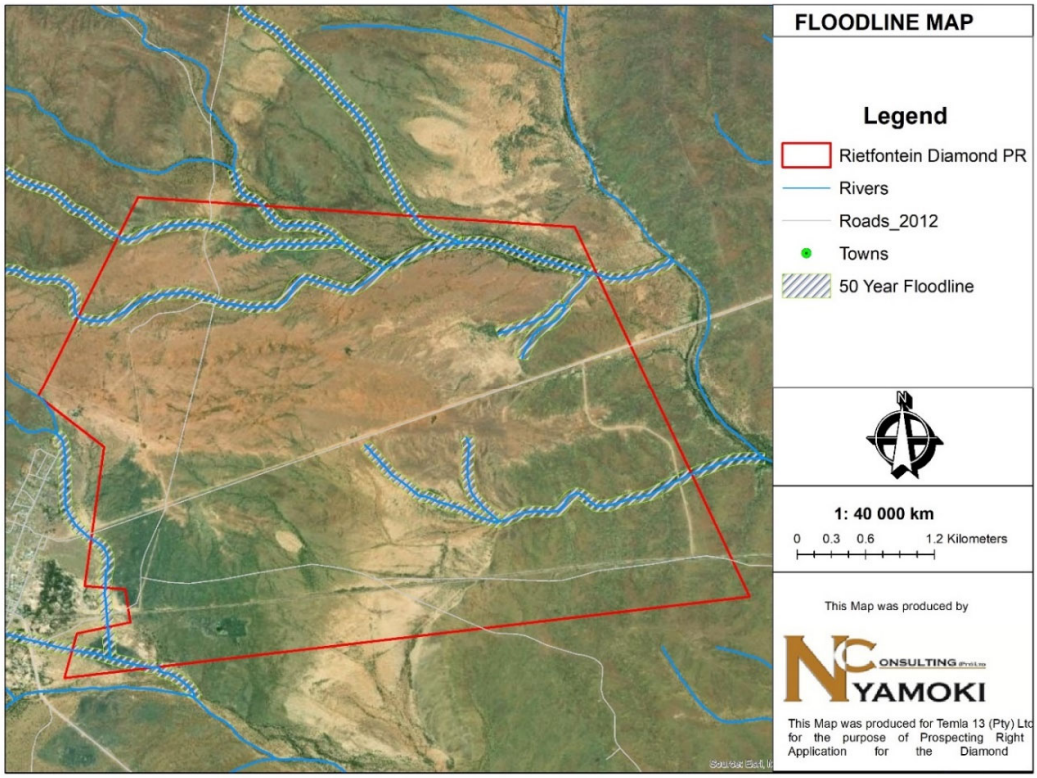



**Figure 10-36: 1: 50-year Floodline**

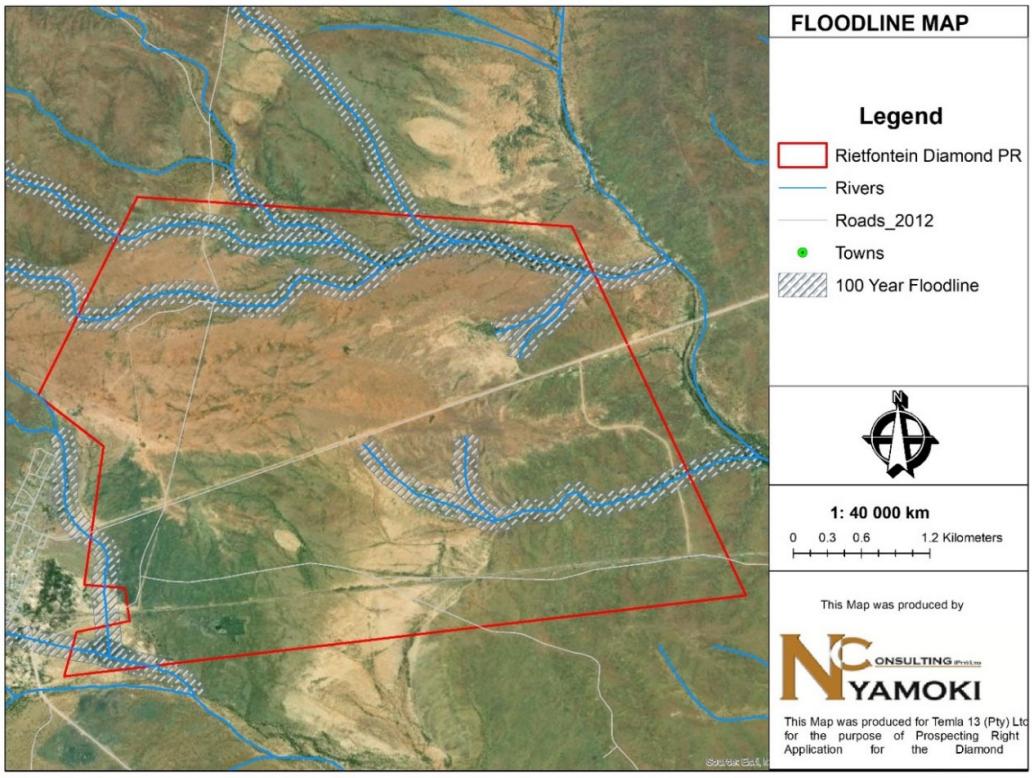



**Figure 10-37: 1: 100-year Floodline**

### 10.14.3 Conceptual Stormwater Management Plan

A conceptual Stormwater Management Plan (SWMP) was developed to mitigate the above impacts, by fulfilling the requirements of the NWA, and more specifically Regulation 6 and 7 of GN704, pertaining to the separation of clean and dirty water and the protection of water resources.

### 10.14.4 Clean and Dirty Areas

Clean and dirty area catchments were delineated from the 5 m spatial resolution Digital Elevation Model (DEM), to calculate the 1:50 year peak flows that would need to be controlled. Clean areas include all areas upslope of the proposed prospecting infrastructure, as well as the topsoil dumps. Dirty areas are those areas that are in contact with prospecting activities and have a potential to contaminate surface water. Based on the surface infrastructure layout, the following areas were classified as dirty:

- Open Cast
- Waste dumps;
- Plant;
- Product stockpiles; and
- ROM stockpiles.

### 10.14.5 Proposed Stormwater Measures and Conceptual Designs

The proposed SWMPs for the Temla13 prospecting right area is presented in Figure 10-38. The SWMPs have been designed as a closed system (i.e. no discharge of dirty water to the environment). Stormwater measures proposed to separate clean and dirty water areas include channels (trenches) and berms as descried in Section 10.14.6.

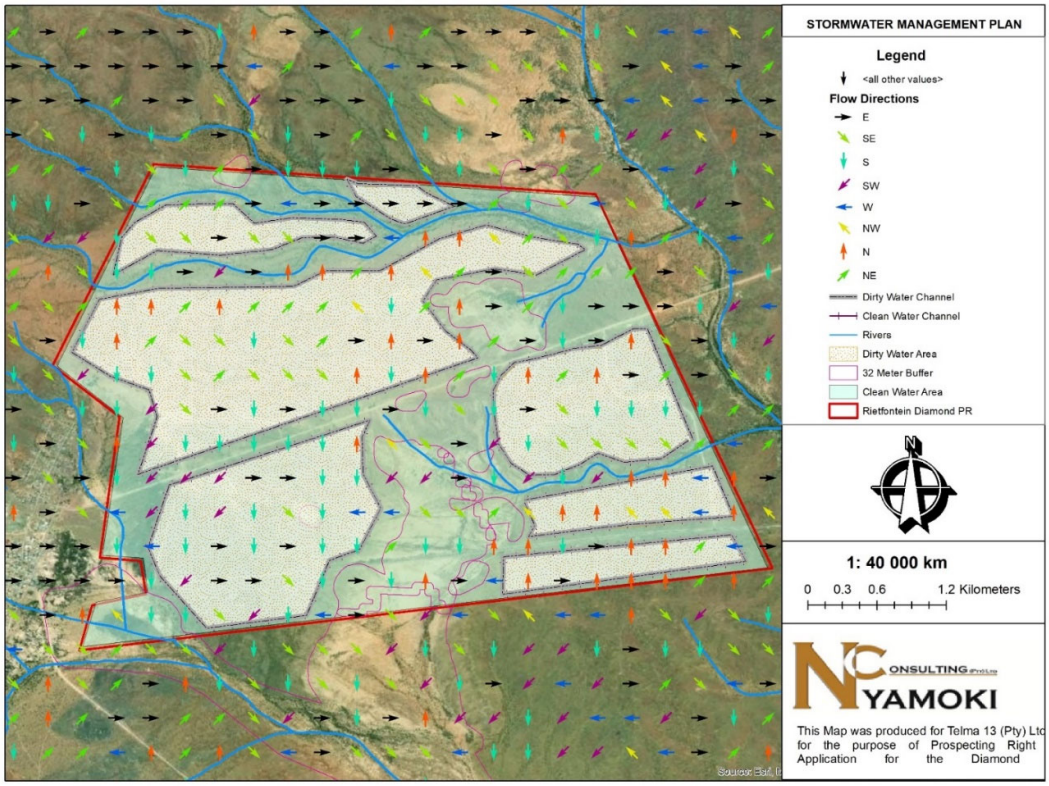



**Figure 10-38: Proposed Stormwater Management Plan**

### 10.14.6 Channels and Berms

It is proposed that the channels will be trapezoidal in shape, with side slopes ranging from 1:2 to 1:3, according to best practices (Figure 10-39). The channels have, as far as practicably possible, been positioned to use the natural slope to convey clean and dirty water. Should space be an issue, then rectangular channels can be considered.

The clean water channels will be unlined but vegetated with indigenous grass species. The excavated material from the channel will be placed on the downslope side, to form a separation berm between clean and dirty areas. The separation berm must also be vegetated with grass. All clean water channels will discharge water into the nearest downslope watercourse.

Runoff from dirty areas will report to a nearby dirty water channel that will be lined to prevent seepage, as required by GN704. It is proposed that all dirty channels are concrete-lined, and that they discharge into the nearest downslope dirty water containment facility.

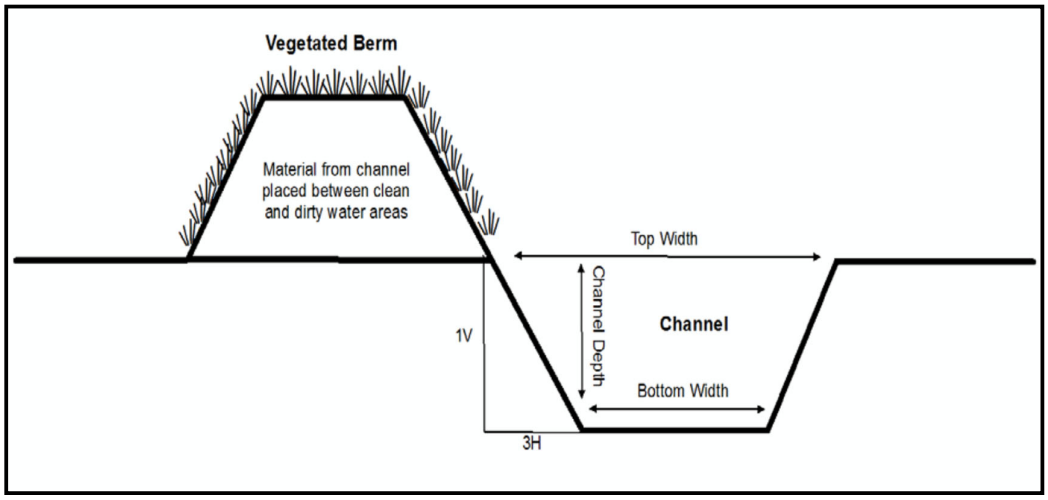



**Figure 10-39: Proposed trapezoidal channel design**

## 10.15 Consolidated Environmental Attributes

Figure 10-40 provides a map of all the sensitive environments and associated buffer areas that are associated with the proposed projects.

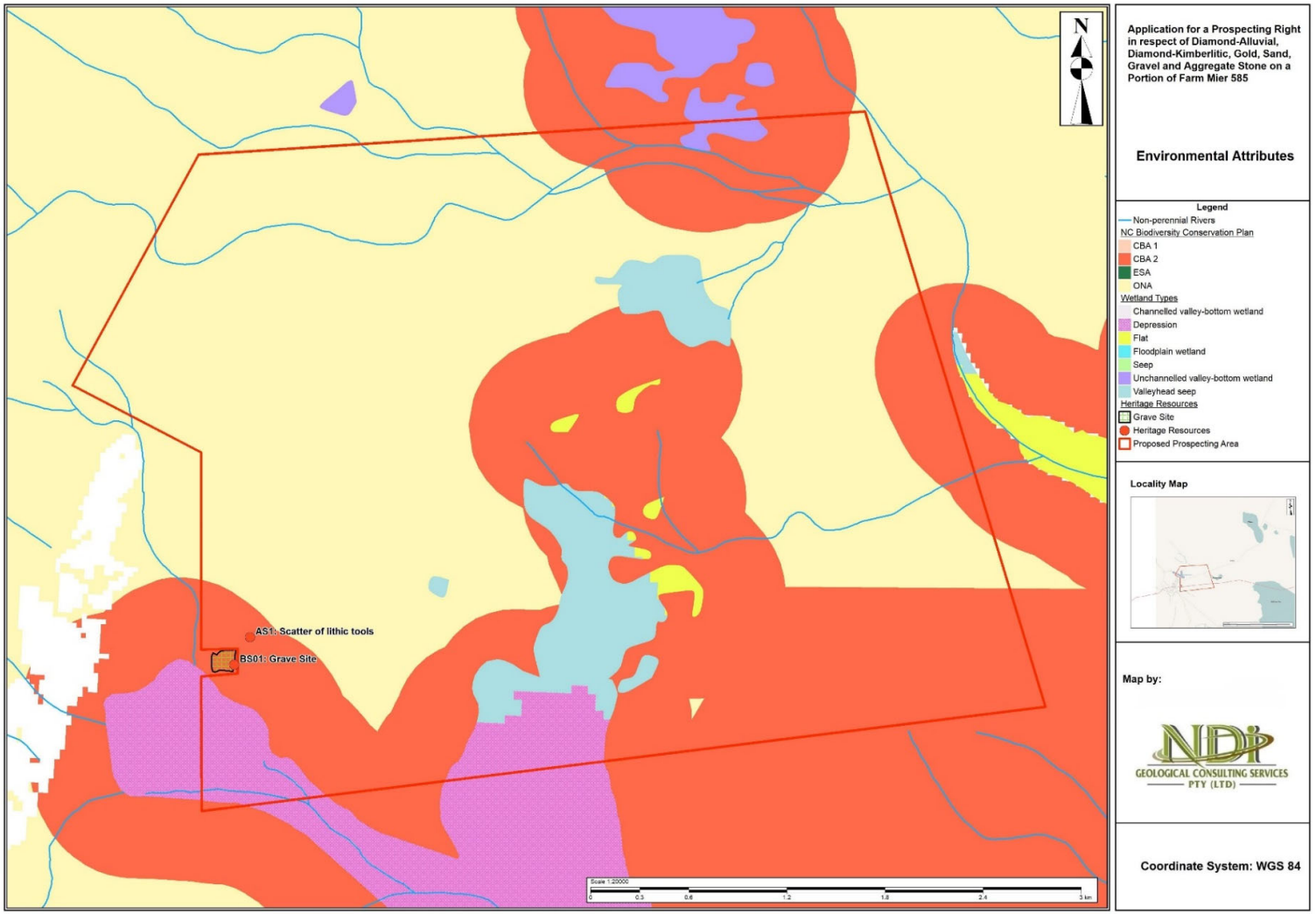



**Figure 10-40: Environmental Attributes**

# 11 Impacts and Risks Identified

Table 11-1 provides a high-level assessment of the potential impacts and associated mitigation measures which could result from the proposed prospecting project during construction, operation, and decommissioning/closure. These impacts will be further refined and assessed according to the impact assessment methodology in Section 14.

**Table 11-1: Summary of Potential Environmental Impacts Associated with the Proposed Development**

| Element of Environment | Potential Impact Descriptions |
|---|---|
| Socio-Economic | Possible job opportunities. |
| Hydrogeology | Possible groundwater contamination. |
| Surface water | Possible surface water contamination. |
| Air Quality | Possible impact on Air Quality in the area. |
| Climate Change | Possible contribution to climate change through emission of Green House Gases |
| Noise | Possible generation of noise during construction and operation. |
| Visual | Possible visual impacts |
| Soils/Land Use/Land Capability | Localised loss of soil resource and change in land capability and land use. |
| Geology | Localised impacts on geology |
| Biodiversity | Localise disturbance and loss of biodiversity, especially Species of conservation Concern (SCC). |
| Heritage | Unlikely but localised possible impact on heritage and cultural resources (including graves) in the area. |
| Traffic | Potential safety issues due to the increased traffic. |
| Cumulative Impacts | Cumulative Impacts |

These impacts have been further refined and assessed according to the quantitative impact assessment methodology in Section 12 and the results are presented in Section 13.

# 12 Methodology used in determining the significance of environmental impacts

The following methodology for determining the significance of environmental impacts will be utilised for the impact assessment phase. The impact assessment methodology has been formalised to comply with Regulation 31(2) (i) of NEMA, which states the following:

> *(2) An environmental impact assessment report must contain all information that is necessary for the competent authority to consider the application and to reach a decision …, and must include –*
> *(I) an assessment of each identified potentially significant impact, including –*
> *(i)* ***cumulative impacts****;*
> *(ii) the* ***nature*** *of the impact;*
> *(iii) the* ***extent*** *and* ***duration*** *of the impact;*
> *(iv) the* ***probability*** *of the impact occurring;*
> *(v) the* ***degree*** *to which the impact can be* ***reversed****;*
> *(vi) the* ***degree*** *to which the impact may* ***cause irreplaceable loss of resources****; and*
> *(vii) the* ***degree*** *to which the impact can be* ***mitigated****.*

All the identified potential impacts were assessed according to the following Impact Assessment Methodology as described below. This methodology has been utilised for the assessment of environmental impacts where the consequence (severity of impact, spatial scope of impact and duration of impact) and likelihood (frequency of activity and frequency of impact) have been considered in parallel to provide an impact rating and hence an interpretation in terms of the level of environmental management required for each impact.

The first stage of any impact assessment is the identification of potential environmental activities[1], aspects[2] and impacts which may occur during the commencement and implementation of a project. This is supported by the identification of receptors[3] and resources[4], which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. Environmental impacts[5] (social and biophysical) are then identified based on the potential interaction between the aspects and the receptors/resources.

The significance of the impact is then assessed by rating each variable numerically according to defined criteria as outlined in Table 12-1. The purpose of the rating is to develop a clear understanding of influences and processes associated with each impact. The severity[6], spatial scope[7] and duration[8] of the impact together comprise the consequence of the impact and when

[1]An ***activity*** is a distinct process or task undertaken by an organisation for which a responsibility can be assigned. Activities also include facilities or pieces of infrastructure that are possessed by an organisation.
[2]An ***environmental aspect*** is an 'element of an organisations activities, products and services which can interact with the environment'. The interaction of an aspect with the environment may result in an impact.
[3]***Receptors*** comprise but are not limited to people or man-made structures.
[4]***Resources*** include components of the biophysical environment.
[5]***Environmental impacts*** are the consequences of these aspects on environmental resources or receptors of particular value or sensitivity, for example, disturbance due to noise and health effects due to poorer air quality. Receptors can comprise, but are not limited to, people or human-made systems, such as local residents, communities and social infrastructure, as well as components of the biophysical environment such as aquifers, flora and palaeontology. In the case where the impact is on human health or well-being, this should be stated. Similarly, where the receptor is not anthropogenic, then it should, where possible, be stipulated what the receptor is.
[6]***Severity*** refers to the degree of change to the receptor status in terms of the reversibility of the impact; sensitivity of receptor to stressor; duration of impact (increasing or decreasing with time); controversy potential and precedent setting; threat to environmental and health standards.
[7]***Spatial scope*** refers to the geographical scale of the impact.
[8]***Duration*** refers to the length of time over which the stressor will cause a change in the resource or receptor.

summed can obtain a maximum value of 15. The frequency of the activity9 and the frequency of the impact10 together comprise the likelihood of the impact occurring and can obtain a maximum value of 10. The values for likelihood and consequence of the impact are then read off a significance rating matrix table as shown in Table 12-1. This matrix thus provides a rating on a scale of 1 to 150 (low, medium low, medium high or high) based on the consequence and likelihood of an environmental impact occurring.

Natural and existing mitigation measures, including built-in engineering designs, are included in the pre-mitigation assessment of significance. Measures such as demolishing of infrastructure, and reinstatement and rehabilitation of land, are considered post-mitigation.

**Table 12-1: Criteria for Assessing Significance of Impacts**

| SEVERITY OF IMPACT | RATING |
|---|---|
| Insignificant / non-harmful | 1 |
| Small / potentially harmful | 2 |
| Significant / slightly harmful | 3 |
| Great / harmful | 4 |
| Disastrous / extremely harmful | 5 |

| SPATIAL SCOPE OF IMPACT | RATING |
|---|---|
| Activity specific | 1 |
| MRA specific (within the PRA boundary) | 2 |
| Local area (within 5 km of the PRA boundary) | 3 |
| Regional | 4 |
| National | 5 |

| DURATION OF IMPACT | RATING |
|---|---|
| One day to one month | 1 |
| One month to one year | 2 |
| One year to ten years | 3 |
| Life of operation | 4 |
| Post closure / permanent | 5 |

**CONSEQUENCE**

| FREQUENCY OF ACTIVITY / DURATION OF ASPECT | RATING |
|---|---|
| Annually or less / low | 1 |
| 6 monthly / temporary | 2 |
| Monthly / infrequent | 3 |
| Weekly / life of operation / regularly / likely | 4 |
| Daily / permanent / high | 5 |

| FREQUENCY OF IMPACT | RATING |
|---|---|
| Almost never / almost impossible | 1 |
| Very seldom / highly unlikely | 2 |
| Infrequent / unlikely / seldom | 3 |
| Often / regularly / likely / possible | 4 |
| Daily / highly likely / definitely | 5 |

**LIKELIHOOD**

[9] ***Frequency of activity*** refers to how often the proposed activity will take place.

[10] ***Frequency of impact*** refers to the frequency with which a stressor (aspect) will impact on the receptor.

**Table 12-2: Determination of Impact Significance**

Consequence

| Likelihood | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 |
| 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 39 | 42 | 45 |
| 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 52 | 56 | 60 |
| 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 |
| 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 | 78 | 84 | 90 |
| 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 | 77 | 84 | 91 | 98 | 105 |
| 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 | 88 | 96 | 104 | 112 | 120 |
| 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 | 117 | 126 | 135 |
| 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 1 | 140 | 150 |

| | | | |
|---|---|---|---|
| | High | 76 to 150 | Improve current management |
| | Medium High | 40 to 75 | Maintain current management |
| | Medium Low | 26 to 39 | |
| | Low | 1 to 25 | No management required |

SIGNIFICANCE = CONSEQUENCE x LIKELIHOOD

# 13 The positive and negative impacts that the proposed activity and alternatives will have

This section contains the assessment of potentially positive and negative environmental impacts that can be caused by the proposed project. The impacts are linked to the activities conducted for the proposed development, broadly relating to pre-construction, construction, operations, and decommissioning phases. Specific emphasis was placed on any relevant environmental, social, and economic impacts identified by the specialist studies, comments received during the stakeholder engagement process, issues highlighted by relevant authorities; as well as a professional judgement of the EAP team through appraisals on the project description, listed activities and the receiving environment.

The objectives for each of the potential environmental impacts identified was to determine their significance and to propose mitigation measures to reduce the impacts to an acceptable level where required. Key potential positive and negative environmental issues relating to the proposed project were assessed according to the adopted methodology for assessing impacts as described in Section 12.

## 13.1 Pre-construction and Construction Phases

The construction phase of the project will entail the site establishment for the access roads, the camp site as well as surveying and pegging sites. Environmental impacts on the biophysical and socio-economic environment which are anticipated to occur throughout the pre-construction and construction phases were identified as follows:

### 13.1.1 Socio-Economic

The main positive impacts of the prospecting activities will be the temporary creation of jobs during the construction phase of the project. The project may also result in a temporary boost in small local businesses in the area.

Site establishment activities may result in grievance as a result of possible grave relocation. It is expected that the final site layout will take into account all the sensitive environment in the area and will avoid graves and other heritage and cultural resources in the area. Movement of construction vehicles on public roads may increase the risks accidents on the roads. Other health and safety risks may be as a result on construction workers lighting fires on site, littering and lack of housekeeping. Potential increase in social pathologies and negative health impacts due to potential squatting of job seekers and increase in nuisance dust may also occur.

### 13.1.2 Groundwater

The use of earth moving machinery and construction vehicles on site poses the risk of chemical spillages including fuel and oils, which may leach into the groundwater. The removal of vegetation could furthermore lower the evapotranspiration rates, thereby allowing a greater volume of potentially contaminated water to percolate to the underlying aquifer in the event of an accidental spills from the machinery. It must however be noted that the removal of vegetation will be limited to the required footprints for the access roads, the boreholes, and sumps as well as the camp sites. The impact on evapotranspiration is therefore expected to be negligible.

Site clearing and grubbing is unlikely to materially affect the groundwater within the project area. However, care should be taken during the utilisation and storage of hydrocarbons and

chemicals, which may have an impact on groundwater quality as a result of spillages and uncontrolled release.

### 13.1.3 Surface water and Hydrology

There are a number of watercourses located on the PRA area which may be impacted by the project. The potential impacts on surface water during the construction phase of the proposed project are as follows:

- Accidental spillages of hazardous substances from construction vehicles used during construction of the crossings, as well as from hazardous storage areas;
- Contamination of runoff by poor materials/waste handling practices;
- Debris from poor handling of materials and/or waste blocking watercourses;
- Contaminated dirty water runoff to surrounding areas resulting in the impact on local surface water quality;
- Increase in turbidity of the local water streams as a result of runoff of cleared areas; and
- Increase of surface runoff and potentially contaminated water that needs to be controlled in the areas where site clearing occurred.

### 13.1.4 Wetlands and Aquatic Ecosystems

The removal of vegetation from the construction area is also expected to have an impact on the provision of ecological and sociocultural services by wetlands and aquatic ecosystems. In addition, construction waste dumping and oil leakages from construction vehicles will alter biodiversity maintenance of the aquatic ecosystems, which endangers the survival of wetlands and aquatic ecosystem and wetland species inhabiting the area. Impacts on the aquatic ecosystems and will include:

- Loss of habitat and aquatic ecosystem and wetland ecological structure as a result of site clearance activities and uncontrolled aquatic ecosystem and wetland habitat degradation;
- Impact on the aquatic ecosystem and wetland systems as a result of changes to the sociocultural service provisions though site clearance, waste management and wetland disturbance;
- There are alien invasive plant species currently present within the area. Any ground disturbance provides an opportunity for alien invasive plant species to spread and for new species to establish themselves in the areas. Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and “quality” of species), change nutrient cycling and productivity, and modify food webs (Zedler & Kercher, 2004). Such changes on the ecology of the riparian habitat have/will have a detrimental impact on its ability to maintain both floral and faunal biodiversity. Invasive alien plant species, particularly woody species, have much increased water usage compared with indigenous vegetation. Many alien invasive plant species are particularly found in riparian ecosystems and their invasion results in the destruction of indigenous species; increased inflammable biomass (high fire intensity); erosion; clogging of waterways such as small streams and drainage channels causing

decreased river flows and incision of river beds and banks. This results in an overall impact on the hydrological functioning of the system.

- Potential poor planning, resulting in the placement of the access roads across aquatic ecosystem and wetland habitats, leading to altered habitat;
- Impact on the hydrological functioning of the aquatic ecosystem and wetland systems;
- Soil compaction and levelling as a result of construction activities and vehicle movement leading to loss of wetland habitat; and
- Increased runoff due to topsoil removal and vegetation clearance leading to possible erosion and sedimentation of wetland resources.

The siting of the boreholes and infrastructure will be in such a way as to avoid sensitive environments, which include the wetland areas and associated 32 m buffer as stipulated by the wetland specialist (Figure 13-2).

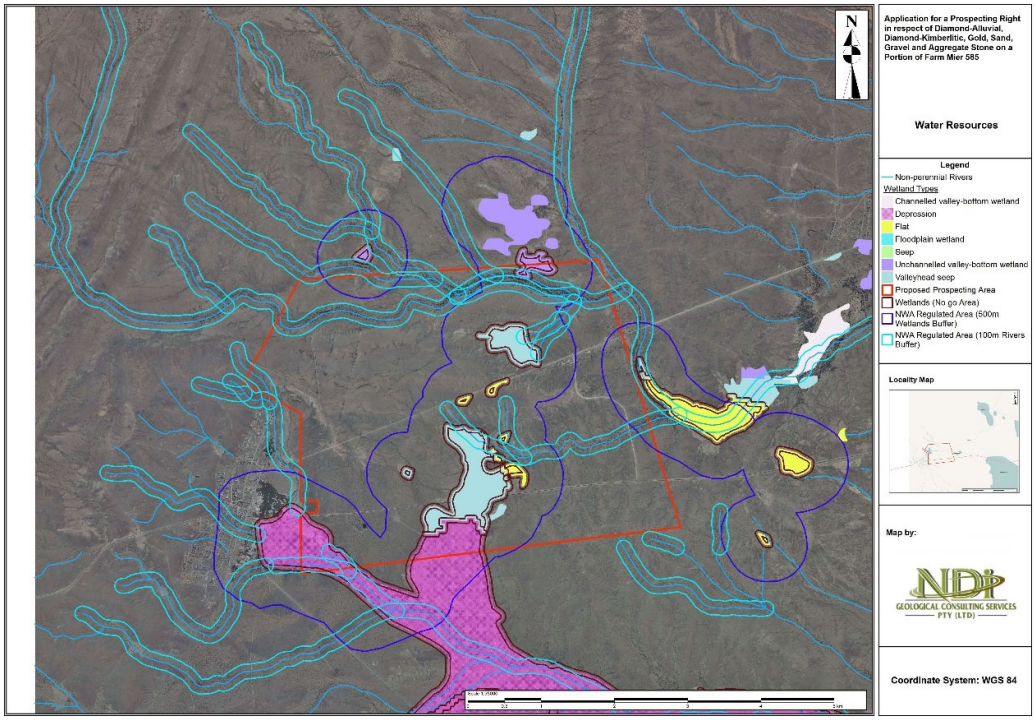



**Figure 13-1: Wetlands and associated 32m buffer (no go areas)**

## 13.1.5 Heritage and Archaeological Resources

The HIA found two heritage resources sites located in the project area, a local burial site and a scatter of lithic tools. The identified burial site has social significance that must be put into consideration during prospecting. The graves are a focus of spiritual and religious significance. It should be noted that burial grounds and gravesites are accorded the highest social significance threshold. They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tempered with or interfered with without a permit from SAHRA. It should also be borne in mind that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present.

The following impacts are envisaged on archaeological artefacts and graves as a result of the construction phase of the proposed project:

- Destruction of archaeological remains;
- Disturbance of graves;
- Disturbance of buildings and structures older than 60 years old; and
- Destruction public monuments and plaques.

The final layout plan will be dependent on the location of local heritage and archaeological resources. The siting of the boreholes and infrastructure will be in such a way as to avoid sensitive environments, which include the burial site and associated 100m buffer as stipulated by the heritage specialist (Figure 13-2).

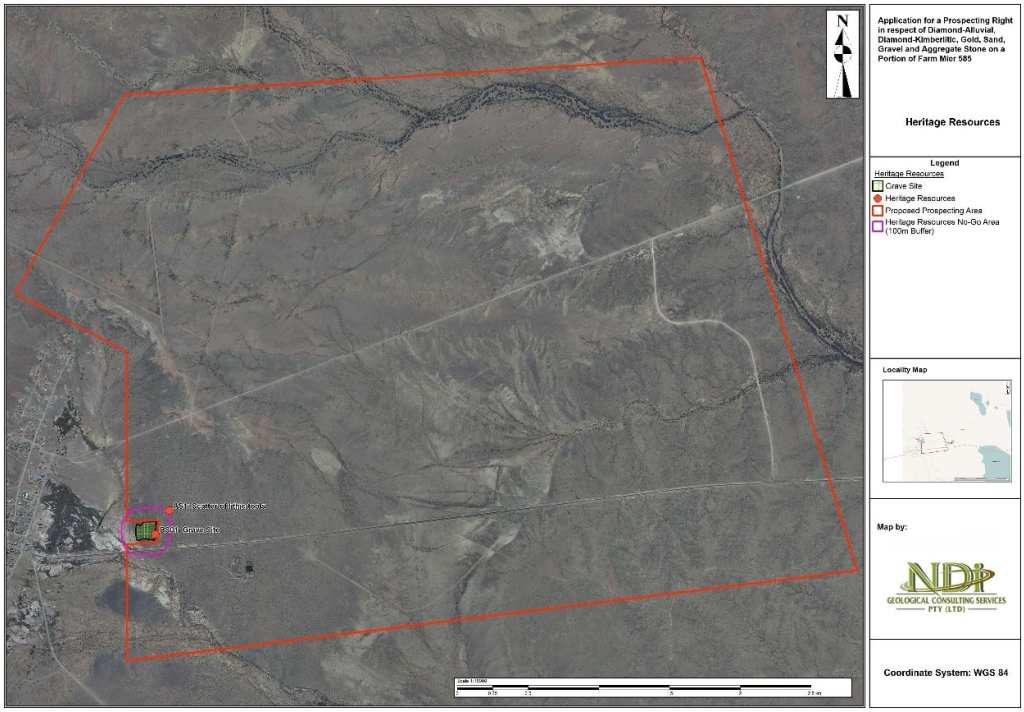



**Figure 13-2: Burial site and Associated 100m buffer area (no-go area)**

## 13.1.6 Palaeontology Impacts

According to the PIA, the impact of the prospecting on the fossil heritage is high for the Kalahari and low for the Dwyka Group. The overburden and inter-burden must always be surveyed for fossils. Special care must be taken during the clearing, digging, drilling, blasting, and excavating of foundations, trenches, channels and footings and removal of overburden if applicable not to intrude fossiliferous layers.

The threats associated with the proposed project are:

- Earth moving equipment/machinery (front end loaders, excavators, graders, dozers) during construction, the sealing-in, disturbance, damage, or destruction of the fossils by development, vehicle traffic, prospecting, bulk sampling, and human disturbance; and

- The sealing-in or destruction of fossils by development, vehicle traffic, clearing, prospecting, and human disturbance.

A Phase 1 Palaeontological Impact Assessment: Phase 1 Field Study is recommended if fossils are found during excavating, drilling, or clearing (according to SAHRA protocol).

### 13.1.7 Flora

The project may result in the following impacts on the floral environment during the construction phase:

- Destruction of potential floral habitats as a result of site clearing, alien species, waste management, vehicle movement and soil disturbance. According to the biodiversity assessment, the properties still have areas that have vegetation regarded as natural with species diversity, In addition to this, minor portions of the study site are located within the area falls within a CBA 1 and 2. As a result of this, the impacts of the proposed prospecting and associated activities, are regarded as highly significant. Due to disturbance of the soil and removal of vegetation, it is likely that alien plants may establish on site. Alien plants often reduce the diversity of an area due to their invasive habit. Invasive plants grow prolifically and out-compete native species. Loss of vegetation will be irreversible and although rehabilitation can be aimed at reinstating the land to some form of land-use, restoration of the natural habitat on site cannot be achieved. This is particularly significant in an area where some plant species remain undescribed. Many species in this habitat are adapted to specific soil composition and structure and the natural species composition cannot be restored after disturbance to the soil (Victor et al. 2005). The impacts attributed with the loss of habitat are listed below in the phase they occur.
- The project may lead to loss of potential SCC. The loss of vegetation habitat on site will reduce the area available for fauna species. Since fauna have the ability to flee the area, the impacts on common animal species are not regarded as highly significant. Endemic fauna, however, have specific habitat requirements and the impacts on these species are considered to be highly significant. The impact of the loss of plant SSC can be reduced by implementing a plant relocation strategy. Plant SSC can be located, removed (and seeds collected) and relocated either in an area within proximity to the site or a nursery. If plants are to be translocated to a different area, it is imperative that the donor and host habitat are similar with regard to topography, geology, soil form and orientation of the slope face. Alternatively, a nursery can be established on site where SSC can be relocated to. Loss of some SSC will invariably occur during either process.

### 13.1.8 Fauna

The project may result in the following impacts on the faunal environment during the construction phase:

- Loss of faunal habitat and ecological structure as a result of site clearing alien invasive species, erosion, and general construction activities;
- Loss of faunal species due to collisions with construction vehicles and machinery;
- Loss of faunal diversity and ecological integrity as a result of construction activities, erosion, poaching and faunal specie trapping;

- Impact on faunal species of conservational concern due to habitat loss and collision with construction vehicles;
- Failure to initiate a rehabilitation plan and alien control plan during the construction phase may lead to further impacts on faunal habitat during the operation phase.

The loss of biodiversity is expected be insignificant as it will be limited to the footprints of the required infrastructure. However, mitigation and management of species of conservational concern, if any, needs to be adhered to. The infrastructure that will have the significant impact on biodiversity is expected to be the access roads.

### 13.1.9 Air Quality

The movement of construction vehicles and earth moving machinery as well as the stripping of vegetation will likely result in an increase in nuisance dust, Particulate Matter $(PM)_{10}$ and $PM_{2.5}$. There is also potential for increase in carbon emissions and ambient air pollution due to the movement of vehicles and construction machinery. It is expected that the implementation of dust suppressing mitigation measures will result in the reduction in nuisance dust.

### 13.1.10 Visual

The proposed project is expected to have visual impacts on the community. The following impacts on the visual character as a result of the proposed project are envisaged during the construction phase:

- Scaring of the landscape as a result of the clearance of vegetation;
- Visual intrusion as a result of the movement of machinery and the erection of contractor camps; and
- Indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site area.

### 13.1.11 Ambient Noise

The use of vehicles and machinery may result in an increase in ambient noise in the immediate vicinity of the project. According to SANS 1013: 2008, should the prevailing ambient noise level be caused to increase due to the introduction of a new noise source/s, the expected community response is given as follows as a function of the excess ambient noise level (□L Req, T).

**Table 13-1: Comparison for assessing community/group response (SANS 10103:2008)**

| Excess (□L Req, T) (dBA) | Estimated community or group response | |
|---|---|---|
| | Category | Description |
| 0 to 10 | Little | Sporadic complaints |
| 5 to 15 | Medium | Widespread complaints |
| 10 to 20 | Strong | Threats of community or group action |
| >15 | Very Strong | Vigorous community or group action |

### 13.1.12 Soil Landuse and Land Capability

During the construction phase, all infrastructure and activities required for the operational phase will be established. The main envisaged activities include the following:

- Movement of construction vehicles, machinery, and workers in unprotected areas (bare) may result in compacting of the soil of the existing roads. Fuel and oil spills from vehicles may result in soil chemical pollution;
- Clearing of vegetation will result in the soils being particularly more vulnerable to soil erosion. The impact can persist long after cessation of prospecting activities depending on mitigation and rehabilitation strategies. Strategic stormwater management should be put in place to minimise soil losses.
- Soil contamination as a result of construction activities can be as a result of a number of activities (i.e. incorrect hazardous substance storage, incidental hydrocarbon leakages from construction vehicles);
- Loss of soil resource and utilisation as a result of the cleaning and topsoil stripping of the construction footprint. Although soils will be stripped and stockpiled, loss of seed reserve and organic matter depletion through decomposition during stockpiling will severely reduce soil quality and its ecological function if not managed appropriately. Re-vegetation should be imposed as far as is possible to maintain soil fertility through natural nutrient cycling during soil storage prior to rehabilitation phase;
- Other activities in this phase that will impact on soil are the handling and storage of waste. This will have the potential to result in soil pollution when not managed properly; and
- In areas of permanent changes such as the borehole and sump area, access roads (tracks), the erection of infrastructure and stockpiles, the current land capability and land use will be lost permanently. This will however be localised to the footprint of the infrastructure.

### 13.1.13 Traffic

The movement of construction vehicles in the project area will result in an increase in traffic on the public roads.

### 13.1.14 Climate Change

The movement of vehicles and earth moving machinery may result in the production of carbon dioxide (Green House Gas (GHG)), which may have an impact on the climate in the area.

The above-mentioned impacts were assessed based on the quantitative impact assessment methodology described in Section 12 of this Report. For each impact assessed, mitigation measures have been proposed to reduce or avoid negative impacts and enhance positive impacts. These mitigations were also incorporated in the EMPr to ensure that they are implemented during the various phases of the proposed project.

The summary of the impact assessment during the construction phase is provided in Table 13-2.

**Table 13-2: Impact Assessment Table for the Pre-Construction and Construction Phase**

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | Management and Mitigation Measures | Severity | Spatial | Duration | Frequency: Activity | | | |
| **Site Establishment: Establishment of the access (tracks) to the prospecting site, Establishment of the campsite, site physical surveying and pegging of drilling sites** | | | | | | | | | | | | | | | | |
| Socio-economic | Influx of job seekers will have a negative social impact on the landowners and land occupiers. | 2 | 2 | 3 | 2 | 2 | 28 | Medium Low (-) | Random and regular alcohol and drug testing shall be conducted on all personnel responsible for operating machinery and driving construction vehicles to ensure the safety of the public;<br>Security and safety should be emphasised;<br>Recruitment will not be undertaken on site;<br>Recruitment practises will favour locals, but farm labourers will not be employed unless agreed to with the farm owners;<br>Liaise with the South African Police Department (SAPD) and existing forums in order to implement effective crime prevention strategies; and<br>No construction workers shall be allowed to access private properties without the owner's knowledge and consent. | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Unauthorised access to private property outside of the demarcated areas will result in conflict with landowners. | 2 | 2 | 3 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Increased traffic in the area will increase the likelihood of accidents on the roads, posing a health and safety issue for the landowners and land occupiers. | 2 | 2 | 3 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | The influx of job seekers in the area may result in an increase in petty crimes. | 2 | 2 | 3 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Ineffective communication channels leading to community unrest. | 2 | 2 | 3 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Negative impact as a result of the dissection of land by clearing and excavations for construction of infrastructure, constraints to access to farmland to farmers, impacting on day-to-day farm activity. | 3 | 1 | 3 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Possible boost in short term local small business opportunities. | 2 | 1 | 2 | 2 | 2 | 20 | Low (+) | Encourage the local employment for the following:<br>• Employment opportunities for local SMME contractors during site clearance, preparation, sourcing construction material and construction.<br>• Secondary service provision of food, toilet | 2 | 1 | 2 | 2 | 2 | 20 | Low (+) |
| | Possible creation of short-term employment for locals | 2 | 1 | 2 | 2 | 2 | 20 | Low (+) | | 2 | 1 | 2 | 2 | 2 | 20 | Low (+) |
| Groundwater | Localised spillages of oils from machinery leaching to groundwater contamination. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | No washing of vehicles shall be allowed outside demarcated areas. The bays will be clearly demarcated and will not be allowed to contaminate any surface runoff; | 2 | 1 | 1 | 2 | 2 | 16 | Low (-) |
| | Existing boreholes within the prospecting area may create conduits of flow to the groundwater unless sealed. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | Sufficient areas shall be provided for the maintenance and washing of vehicles;<br>Refuelling of vehicles will only be allowed in designated areas;<br>All construction equipment shall be parked in a demarcated area<br>Drip trays shall be used when equipment is not used for some time;<br>On surface bulk storage of hydrocarbons must be situated in a dedicated area which will include a bund or a drain where necessary to contain any spillages during the use, loading and off-loading of the material;<br>Bund areas shall contain 110% of the stored volume;<br>Bund areas must be impermeable;<br>Bund areas must have a facility such as a valve/sump to drain or remove clean stormwater;<br>Contaminated water shall be pumped into a container for removal by an approved service provider;<br>Regular inspections shall be carried out to ensure the integrity of the bundwalls;<br>All preventative servicing of earth moving equipment and construction vehicles shall be undertaken off site;<br>Runoff from this area shall be contained; | 2 | 1 | 1 | 2 | 2 | 16 | Low (-) |

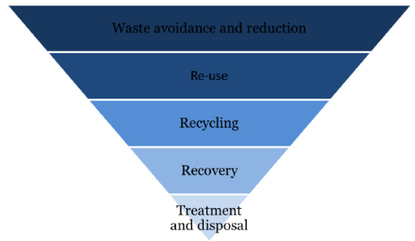
| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | Management and Mitigation Measures | Severity | Spatial | Duration | Frequency: Activity | | | |
| | | | | | | | | | Spill kits shall be made available, and all personnel shall be trained on how to use the kits and training records shall be made available on request. | | | | | | | |
| Surface Water | Increase in silt load in runoff due to site clearing, grubbing and the removal of topsoil from the footprint area associated with the drill sites and associated infrastructure. | 2 | 3 | 2 | 2 | 2 | 28 | Medium Low (-) | Ensure the clean and dirty water segregation.<br>Spill kits to be made available at areas of possible spillages of hazardous substances.<br>Remediation of spillages must be conducted on a continual basis.<br>Contaminated runoff will be contained and re-used where necessary.<br>No direct discharge of polluted water to the environment is permitted.<br>Ensure that topsoil is properly stored, away from the streams and drainage areas.<br>No construction activities are allowed within 100 metres from the nearby steams without authorisation from the DWS.<br>Vehicle and personnel movement within watercourses/ wetland areas/riparian areas shall be strictly prohibited.<br>Ensure that topsoil is properly stored, away from sensitive environmental areas which include the wetland areas, the streams and heritage sites;<br>Vehicle and personnel movement within watercourses and drainage areas shall be strictly prohibited;<br>Adequate stormwater management must be incorporated into the design of the project in order to prevent contamination of water courses and wetlands from dirty water. | 1 | 1 | 1 | 2 | 2 | 1<br>2 | Low (-) |
| | Potential deterioration in water quality due to the potential accidental spillages of hazardous substances. | 2 | 3 | 2 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 2 | 2 | 1<br>2 | Low (-) |
| | Debris from poor handling of materials and/or waste blocking watercourses, resulting in flow impediment and pollution. | 2 | 2 | 2 | 2 | 2 | 24 | Low (-) | | 1 | 1 | 1 | 2 | 2 | 1<br>2 | Low (-) |
| | Contaminated dirty water runoff to surrounding areas resulting in the impact on local surface water quality. | 2 | 3 | 2 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 2 | 2 | 1<br>2 | Low (-) |
| | Increase of surface runoff and potentially contaminated water that needs to be maintained in the areas where site clearing occurred. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 2 | 2 | 1<br>2 | Low (-) |
| Aquatic Ecosystems | Localised changes to the wetland areas as a result of vegetation clearing. | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (-) | Adequate stormwater management must be incorporated into the design of the project in order to prevent erosion and the associated sedimentation of the aquatic system;<br>No construction activities shall be allowed within 500 m of wetland areas without consent from the DWS;<br>No vehicles may be allowed to indiscriminately drive through the wetland areas or within the active stream channels;<br>All disturbed areas shall be re-vegetated with indigenous species;<br>No construction activities and/or access will be undertaken within the 32m wetland buffer determined by the specialist;<br>All construction materials shall be kept out of the wetland areas; and<br>All vehicles shall be regularly inspected for leaks. Re-fuelling must take place outside the project area, on a sealed surface area to prevent ingress of hydrocarbons into topsoil and aquatic ecosystems | | | | | | | Low (-) |
| | Loss of habitat and aquatic ecological structure as a result of site clearance activities and uncontrolled aquatic ecosystem degradation. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | | | | | | | | Low (-) |
| | Impact on the aquatic ecological systems as a result of changes to the sociocultural service provisions. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | | | | | | | | Low (-) |
| | Increased runoff due to topsoil removal and vegetation clearance leading to possible erosion and sedimentation of wetland resources. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | | | | | | | | Low (-) |
| | Soil compaction and levelling as a result of construction activities and vehicle movement leading to loss of wetland habitat. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | | | | | | | | Low (-) |
| | Impact on the hydrological functioning of the aquatic ecosystems. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | | | | | | | | Low (-) |
| Heritage Resources | The proposed project has the potential to impact on local burial site within the area. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | No construction activities may be undertaken within100 m of the burial site as shown in Figure 13-2;<br>The identified burial site must be barricaded by a danger warning tape to avoid any accidental damage during prospecting.<br>A copy of the chance finds procedure must be kept at the site office to ensure appropriate management of any accidental finds during prospecting. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| | The proposed project has the potential to impact on sites of archaeological importance. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) | Use chance find procedure to cater for accidental finds | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | Management and Mitigation Measures | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | | Severity | Spatial | Duration | Frequency: Activity | | | |
| Palaeontological Resources | Drilling of exploratory boreholes has potential to impact on palaeontological resources | 2 | 1 | 2 | 2 | 1 | 20 | Low (-) | The mitigation is done in order to rescue representative fossil material from the study area to allow and record the nature of each locality and establish its age before it is destroyed and to make samples accessible for future research. It also interprets the evidence recovered to allow for education of the public and promotion of palaeontological heritage.<br>Should fossils be exposed during construction work, it should immediately be reported to a palaeontologist so that an investigation and evaluation of the finds can be made.<br>If any palaeontological material is exposed during digging, excavating, drilling, or blasting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| Flora | Loss of localised biodiversity habitats within sensitive areas due to site clearance and establishment of drill sites and access roads. | 3 | 3 | 2 | 2 | 2 | 32 | Medium Low (-) | The Contractor shall be on the lookout for SCC and any floral SCC encountered within the development footprint are to be relocated to areas with suitable habitat, outside the disturbance footprint;<br>Floral species of conservation concern, if encountered within the development footprint, are to be handled with care and the relocation of sensitive plant species to suitable similar habitat is to be overseen by a botanist;<br>The proposed development footprint shall be kept to the minimum;<br>All disturbed areas must be concurrently rehabilitated during construction;<br>Prohibit the collection of any plant material for firewood or medicinal purposes;<br>The existing integrity of flora surrounding the study area shall be upheld and no activities shall be carried out outside the footprint of the construction areas;<br>Edge effect control shall be implemented to avoid further habitat degradation outside of the proposed footprint area;<br>All sensitive open space areas will be demarcated and access into these areas shall be prohibited;<br>Protected floral species occurring within the vicinity of the study area, but outside the disturbance footprint shall be fenced for the duration of the construction activities;<br>Monitoring of relocation success will be conducted during the operational phase;<br>Construction related activities shall be kept strictly within the development footprint;<br>Construction vehicles shall only be allowed on designated roadways to limit the ecological footprint of the project.<br>Alien Invasive Plant Species Management plan to be implemented;<br>Edge effects of activities including erosion and alien/ weed control will be strictly managed around the wetland areas;<br>All sites disturbed by construction activities shall be monitored for colonisation by exotic or invasive plants;<br>Exotic or invasive plants shall be controlled as they emerge;<br>An alien vegetation control program must be developed and implemented within all disturbed areas. After removal of alien vegetation, the affected areas must be re-assessed to determine the success of the program and any follow up measures that may be required; | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Loss of localised floral species diversity including RDL and medicinal protected species due to site clearance and site establishment. | 3 | 3 | 2 | 2 | 2 | 32 | Medium Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Potential spreading of alien invasive species as indigenous vegetation is removed, and pioneer alien species are provided with a chance to flourish. | 3 | 3 | 2 | 2 | 2 | 32 | Medium Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | Management and Mitigation Measures | Severity | Spatial | Duration | Frequency: Activity | | | |
| | | | | | | | | | The eradicated plant material must be disposed of at an approved solid waste disposal site;<br>During post-construction, an alien vegetation removal and monitoring plan must be compiled for those areas which were not effectively rehabilitated;<br>The extent of invasion must be established through investigation to identify priority areas;<br>Priority species shall be identified to control and develop protocols for the removal of all alien species e.g. mechanical removal, herbicidal treatment etc. Mechanical, methods must be favoured for the removal of alien invasive species. Chemical removal shall only be undertaken by a suitably qualified and approved person; and<br>As much vegetation growth as possible must be promoted in order to protect soils. In this regard, special mention is made of the need to use indigenous vegetation species where hydro seeding, rehabilitation planting (where applicable) is to be implemented. | | | | | | | |
| Fauna | Vegetation clearance may result in loss of faunal habitat ecological structure, species diversity and loss of species of conservation concern. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) | The proposed development footprint areas shall remain as small as possible and where possible be confined to already disturbed areas;<br>No trapping or hunting of fauna shall be permitted;<br>Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which may affect faunal habitat, need to be strictly managed;<br>Should any SCC be encountered within the study area, these species will be relocated to similar habitat within or in the vicinity of the study area with the assistance of a suitably qualified specialist;<br>No informal fires in the vicinity of construction areas shall be permitted;<br>An alien vegetation control plan must be developed and implemented in order to manage alien plant species occurring within the study area, and to prevent further faunal habitat loss. | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Habitat fragmentation as a result of construction activities of the access roads leading to loss of floral diversity. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Loss of faunal diversity and ecological integrity as a result of construction activities, erosion, poaching and faunal specie trapping. | 2 | 2 | 2 | 2 | 2 | 24 | Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Movement of construction vehicles and machinery may result in collision with fauna, resulting in loss of fauna. | 2 | 2 | 2 | 2 | 2 | 24 | Low (-) | | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| Air Quality | Possible increase in dust generation, $PM_{10}$ and $PM_{2.5}$ as a result of bulk earthworks, operation of heavy machinery, and material movement. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | Dust suppression measures shall be implemented on dry weather days and periods of high wind velocities;<br>Appropriate dust suppression measures may include spraying with water;<br>Where practical rehabilitation should be undertaken in tandem with the construction activities;<br>A speed limit of 40 km/hr shall apply to limit vehicle entrained dust from the unpaved road;<br>All construction equipment must be scheduled for preventative maintenance to ensure the functioning of the exhaust systems to reduce excessive emissions and limit air pollution;<br>Dust control suppression shall be implemented on dry weather days and periods of high wind velocities;<br>Appropriate dust suppression measures may include limiting the extent of open areas, reducing the frequency of disturbance, and spraying with water;<br>Where practical rehabilitation should be undertaken progressively;<br>Materials transported on public roads must be covered;<br>*Odours:* | 1 | 2 | 1 | 1 | 2 | 12 | Low (-) |
| | Increase in carbon emissions and ambient air pollutants ($NO_2$ and $SO_2$) as a result of movement of vehicles and operation of machinery/equipment. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | | 1 | 2 | 1 | 1 | 2 | 12 | Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | Management and Mitigation Measures | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | | Severity | Spatial | Duration | Frequency: Activity | | | |
| | | | | | | | | | Putrescible waste must be handled, stored, and disposed of before the probability of it generating odours; and<br>Chemical toilets must be emptied / serviced on a regular basis. Proof of this must be provided to the Engineer. | | | | | | | |
| Visual | Scaring of the landscape as a result of the clearance of vegetation. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | The number of construction vehicles and machinery to be used shall be kept to a minimum;<br>Movement of vehicles shall be kept to outside busy hours to minimise the visual impacts on the residents;<br>Materials transported on public roads must be covered;<br>Provide sufficient routes that do not affect the immediate urban environment.<br>Construct buffer zones before construction commences – mounds with trees to screen off.<br>Where possible, rehabilitation of the work areas shall be undertaken in tandem with construction to ensure that areas stripped of vegetation are kept to a minimum.<br>Proper waste management must be undertaken throughout the life of the project | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Visual intrusion as a result of the movement of machinery and the establishment of the required infrastructure. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site area. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Improper waste management will also increase the impacts of visual impacts onsite. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| Noise | The use of vehicles and machinery during the construction phase may generate noise in the immediate vicinity. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | Minimise noise pollution and ensure compliance in terms of controlled area noise thresholds (if any).<br>All activities must be conducted in accordance with municipal by-laws.<br>Where possible, working activities during construction, particularly noise/vibration producing activities, must be confined to the following working hours:<br>• Monday to Friday, 07h00 to 17h00 Saturday, 07h00 to 15h00<br>• No work on Sundays and public holidays<br>Adjacent landowners must be advised of any work that will take place outside of normal working hours, that may be disruptive (e.g. noise) in advance;<br>High Noise areas must be demarcated<br>Surrounding communities must be notified in advance of noisy construction activities;<br>All equipment should be provided with standard mufflers;<br>Muffling units on vehicles and equipment must be kept in good working order.<br>Construction staff working in areas where the 8-hour ambient noise levels exceed 85 Dba should wear ear protection equipment;<br>Where possible, operation of several equipment and machinery simultaneously must be avoided;<br>All equipment must be kept in good working order, with immediate attention being paid to defective silencers, slipping fanbelts, worn bearings and other sources of noise;<br>Equipment must be operated within specifications and capacity (e.g. no overloading of machines);<br>Regular maintenance of equipment must be undertaken, particularly with regard to lubrication;<br>Equipment shall be switched off when not in operation;<br>Appropriate directional and intensity settings must be maintained on all hooters and sirens; | 1 | 1 | 1 | 2 | 1 | 9 | Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | Management and Mitigation Measures | Severity | Spatial | Duration | Frequency: Activity | | | |
| | | | | | | | | | The Contractor must ensure that the employees conduct themselves in an appropriate manner while on site | | | | | | | |
| Soil, Land use and Land Capability | Localised chemical pollution of soils as a result of vehicle hydrocarbon spillages and compaction. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) | Contaminated soil shall be removed and disposed of to an appropriate licensed landfill site in terms of NEMWA, or can be removed by a service provider that is qualified to clean the soil;<br>The time in which soils are exposed during construction activities should remain as short as possible;<br>Erosion control measures shall be implemented where deemed necessary;<br>In general, all steep slopes steeper than 1:3 or where the soils are more prone to erosion must be stabilised;<br>If stockpiles are not going to be used immediately the stockpiles shall be rehabilitated to prevent erosion;<br>Runoff from stockpiles shall be detained in order to support growth of vegetation;<br>Runoff from the stockpiles shall be suitably managed to ensure that the runoff volumes and velocities are similar to pre disturbed levels;<br>Vegetation shall be used to promote infiltration of water into the stockpile instead of increasing runoff;<br>A monitoring programme will be implemented if the stockpiles are not used within the first year whereby the vegetation of the stockpiles is monitored in terms of basal cover and species diversity;<br>If it is noticed that the vegetation on the stockpiles is not sustainable, appropriate corrective actions shall be taken to rectify the situation;<br>Stockpiles shall be maintained until the topsoil is required for rehabilitation purposes;<br>Topsoil stockpiles shall be monitored regularly to identify alien vegetation, which shall be removed as soon as possible to prevent further distribution of any alien vegetation. | 1 | 1 | 1 | 2 | 1 | 9 | Low (-) |
| | Localised clearing of vegetation and compaction of the construction footprint will result in the soils being particularly more vulnerable to soil erosion. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Localised loss of resource and its utilisation potential due to compaction over unprotected ground/soil. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| | Localised loss of soil and land capability due to reduction in nutrient status - de-nitrification and leaching due to stripping and stockpiling footprint areas. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) | | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| Traffic | Increase in traffic volumes as a result of pre-construction activities which may lead to an increase in traffic congestion along the public roads as well as the farm roads around the prospecting area. | 2 | 3 | 2 | 2 | 2 | 28 | Medium Low (-) | Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads;<br>The number of construction vehicles and trips shall be kept to a minimum; and<br>Where possible the transportation of construction materials and rubbish shall be undertaken outside traffic peak hours to minimise inconveniencing residents. | 2 | 2 | 2 | 1 | 2 | 18 | Low (-) |
| Climate | Emissions of Green House Gases as a result of the use of plant, heavy moving machinery, generators etc. | 2 | 2 | 2 | 2 | 2 | 24 | Low (-) | All the construction vehicles shall undergo maintenance on a regular basis to improve on the combustion engine vehicle efficiency. | 1 | 2 | 1 | 1 | 1 | 8 | Low (-) |
| Waste Management | Potential water and soil pollution as a result of inappropriate waste management practices. | 2 | 3 | 2 | 2 | 2 | 28 | Medium Low (-) | Waste management will be undertaken in line with the NEM: WA Waste Management Hierarchy, ensuring re-use and recycling of waste as much as possible. | 2 | 2 | 2 | 1 | 2 | 18 | Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | Management and Mitigation Measures | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | | Severity | Spatial | Duration | Frequency: Activity | | | |
| | | | | | | | | |  **Figure 13-3: Waste Hierarchy**<br>*Separation of waste:*<br>All waste shall be separated into general waste and hazardous waste;<br>Hazardous waste shall not be mixed with general waste and in doing so increase the quantities of hazardous waste to be managed;<br>General waste can further be separated into waste that can be recycled and or reused;<br>No littering shall be allowed in and around the site, a sufficient number of bins shall be provided for the disposal of waste;<br>Where necessary dedicate a storage area on site for collection of construction waste.<br>*Storage of waste:*<br>No stockpiling of debris shall be permitted within 100 m of any water courses or within 500 m of wetland areas;<br>General waste will be collected in an adequate number of litter bins located throughout the construction site;<br>Bins must have lids in order to keep rainwater out;<br>Bins shall be emptied regularly to prevent them from overflowing;<br>All work areas shall be kept clean and tidy at all times;<br>All waste management facilities will be maintained in good working order;<br>Waste shall be stored in demarcated areas according to type of waste;<br>Runoff from any area demarcated for waste will be contained, treated, and reused;<br>Flammable substances must be kept away from sources of ignition and from oxidizing agents;<br>No construction rubble shall be disposed of to the wetland area;<br>If construction rubble is not removed immediately, it shall be stockpiled outside the 1:100-year floodline and outside the sensitive wetland areas;<br>Demolition waste and surplus concrete shall be disposed of responsibly;<br>Waste shall not be buried or burned on site; and<br>The maximum retention time for temporary storage of waste generated shall not exceed 30 days, provided the waste does not present a health hazard or risk of odour.<br>*Disposal of hazardous waste:* | | | | | | |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | Management and Mitigation Measures | Severity | Spatial | Duration | Frequency: Activity | | | |
| | | | | | | | | | No dumping shall be allowed in or near the construction site;<br>Hazardous containers shall be disposed of at an appropriate licensed site;<br>Hazardous waste will be removed and managed by an approved service provider;<br>A safe disposal certificate will be provided by the approved service provider as proof of responsible disposal of hazardous waste; and<br>The safe disposal certificate shall be stored and provided on request.<br>*Disposal of general waste:*<br>No dumping shall take place in or near the construction site;<br>All general waste shall be disposed of to the nearest licensed landfill site;<br>Demolition waste and builder's rubble shall be disposed of to an appropriate licensed landfill site; and<br>The necessary permissions must be obtained to dispose of builders' rubble to the landfill site. | | | | | | | |

## 13.2 Operational Phase

The operation phase of the project will include drilling of boreholes for the prospecting of Diamond Alluvial, Diamond General and Diamonds. The phase also includes the excavation of trenches and bulk sampling and processing of the relevant minerals.

### 13.2.1 Social-Economic

It is expected that during the operation phase the project will not result in the creation of employment as prospecting requires highly specialised personnel. The applicant will make use of qualified contractors for the drilling and sampling of the sites. The community will however continue to benefit as a result of the continued boost in small local businesses. The socio-impacts expected during the operation phase include:

- Impact on the day-to-day operation by landowners in the area, which may have an impact on their livelihoods;
- Negative impacts on health and safety of the local communities as a result of additional vehicles on the roads;
- Negative impact on, local community health and safety due to influx of employees, the presence of job seekers, which may lead to prostitution and conflict with the local communities. Illegal informal settlement of job seekers in the area may exacerbate the situation; and
- Potential damage to adjacent landowners'/occupiers' infrastructure as a result of drilling activities.

### 13.2.2 Groundwater

The use of vehicles during the drilling of the exploration boreholes may result in the spillages of hydrocarbons from vehicles and machinery. This will result in the contamination of soils and groundwater.

The prospecting operations will require the drilling of boreholes, which my result in the drawdown, which may affect the yield to the surrounding groundwater users.

Material used for backfilling boreholes may leach pollutants, which will result in the contamination of surrounding groundwater regime. This may spread beyond the backfilling site via plume migration.

In addition, the seepage of contaminated water in the slimes dams can also result in groundwater pollution.

### 13.2.3 Surface water and Hydrology

Drilling operations my result in the generation of surface water runoff contaminated with drill muds and cuttings, should spillage occur. The runoff containing sediments will have negative impacts on the water quality due to increase turbidity and sedimentation of water courses. This will also have an impact on aquatic habitats.

The potential impacts the proposed project may have on surface water hydrology were identified as follows:

- Impact of the Removal and Alteration of Natural Water Courses on Catchment Response: The proposed shallow pits have not yet been determined; however, it will certainly cover a significant portion of the proposed project area. Inevitably, certain existing non perennial water courses that collect and convey surface water runoff to drainage lines and wetlands would be removed or altered.
- Impact of Reduced Peak Runoff and Discharge Volumes on Water Courses The proposed prospecting development would require construction of Prospecting and bulk sampling with pits and trenches; Ablution facility; Access roads; Diesel storage; Office site; Plant site; Slimes dam; Office Area; and Vehicle parking area. Being classified as "dirty," rain falling on this infrastructure would be captured and contained. Consequently, the quantum of surface water runoff would reduce.

**Table 13-3: Comparison between Recurrence Interval and Exceedance Probability**

| Recurrence Interval (RI) | Probability of Exceedance (PE) |
|---|---|
| 2 | 50% |
| 5 | 20% |
| 10 | 10% |
| 20 | 5% |
| 50 | 2% |
| 100 | 1% |
| 200 | 0.5% |

The small PE events typically cause flood damage, whilst the large PE storms do not. For this impact assessment, these contradictory outcomes will be considered separately. The reduction in small PE (*i.e.* large RI) floods is viewed as a positive impact as the risk of damage to downstream communities, property, operations, or infrastructure would be reduced. However, the concomitant reduction in MAR is considered a negative impact. The positive sign is therefore considered to be moderate during the construction phase of the project. The degree of confidence in this assessment is medium.

- Impact of Reduction in Mean Annual Runoff (MAR) on Downstream Surface Water Resources: Whereas the reduction in small PE (i.e. large RI) storm peak flows are seen as a positive impact, the reduction in MAR is considered a negative impact. The reason for this apparent contradiction is that smaller storm events have a natural, restorative function in the local ecosystem. Conversely, large storm events, while part of the natural cycle, can be destructive. The impact of large storms is presented in the preceding section. The calculated reduction in MAR can be viewed in terms of the greater quaternary catchment level. The hydrology study shows that the resultant reduction in quaternary catchment MAR is 3%. This is seen as negligible. The combined significance of this impact is therefore considered to be moderate during the construction, operation, and decommissioning phases of the project.
- Impact of Increased Sediment Yield on Surface Water Quality: Given the erosion potential of the local soils, it is likely that the construction and operational phases of the proposed development would cause an increase in erosion. Thus, an increase in sediment deposition could be expected at the drainage lines and wetlands. To limit the

environmental impact on faunal and floral communities, sediment yield must be reduced as far as possible. Sediment load is measured in terms of Total Suspended Solids (TSS), but through the effective design and deliberate implementation of BMP "treatment trains, its impact can be mitigated. The potential impact, which would be direct and negative, is considered to be of moderate significance during the construction and operation phases of the project, and minor significance during the decommissioning phase.

### 13.2.4 Wetlands and Aquatic Ecology

In addition to the impacts on aquatic habitats as explained in Section 13.1, the operation phase of the project is expected to have the following impacts on aquatic ecosystems:

- Sedimentation and soil erosion: Soil erosion will result in the deposition of sediment into the wetland systems; posing a risk to the downstream catchment's geomorphological/functional integrity. Subsequent impacts that are likely to result are: a loss of instream flow including aquatic refugia and flow dependent taxa; sedimentation of the watercourse that will be destructive to many faunal species affecting their habitat; breeding and feeding cycles. During the operational phase of the prospecting area rainfall is likely to filter through into the project waste, This water is likely to accumulate particles and pollutants that will pose a risk to the surrounding watercourses. Sediment that washes off the project site during periods of rainfall will also contribute to increased sedimentation in the aquatic environment. Erosion and sedimentation impacts are linked to alterations in hydrological regimes as a result of increased storm water flood peaks associated with increased impermeable surfaces and the concentration of flows. Increases in peak discharge may significantly increase stream power, increasing the risk of erosion (localised scouring and incision) and resultant sedimentation of watercourses. Local site factors such as soil erodibility, vegetation cover, gradient of local slopes and regional rainfall/runoff intensity will affect the probability and intensity of erosion impacts (Macfarlane et al., 2014). Typical results of erosion & sedimentation on water resources may include:
    - Localised scouring at stormwater discharge points into watercourses
    - Deposition of large masses of sediment downstream causing localised channel braiding, instability of the river banks and alterations in water distribution.
- Pollution of water resources and soil: Changes to the water quality will result in changes to the ecosystem structure and function as well as a potential loss of biodiversity. Water quality pollution leads to modification of the species composition where sensitive species are lost and organisms tolerant to environmental changes dominate the community structure. Any substances entering and polluting watercourses will directly impact downstream ecology through surface runoff during rainfall events, or subsurface water movement, particularly during the wetter summer months. Contaminants such as hydrocarbons, solids, pathogens, and hazardous materials may enter watercourses (examples include petrol/diesel, oil/grease, paint, cement/concrete and other hazardous substances). These contaminants negatively affect aquatic ecosystems including sensitive or intolerant species of flora and fauna. Where significant changes in water quality occur, this will ultimately result in a shift in aquatic species composition, favouring more tolerant species, and potentially resulting in the localised exclusion of sensitive species. Water quality monitoring must be implemented to ensure sustainable

management of water sources within that area. Sudden drastic changes in water quality can also have chronic effects on aquatic biota leading to localised extinctions. Deterioration in water quality will also affect its suitability for human domestic/agricultural use and have far reaching impacts for local communities who may rely on rivers as water supply (Macfarlane et al., 2014).

- Alien Invasive Species: There are alien invasive plant species currently present within the area. Any ground disturbance provides an opportunity for alien invasive plant species to spread and for new species to establish themselves in the areas. Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and "quality" of species), change nutrient cycling and productivity, and modify food webs (Zedler & Kercher, 2004). Such changes on the ecology of the riparian habitat have/will have a detrimental impact on its ability to maintain both floral and faunal biodiversity. Invasive alien plant species, particularly woody species, have much increased water usage compared with indigenous vegetation. Many alien invasive plant species are particularly found in riparian ecosystems and their invasion results in the destruction of indigenous species; increased inflammable biomass (high fire intensity); erosion; clogging of waterways such as small streams and drainage channels causing decreased river flows and incision of river beds and banks. This results in an overall impact on the hydrological functioning of the system.

### 13.2.5 Flora

The project may result in the following impacts on the floral environment during the operation phase:

- Destruction of potential floral habitats as a result of continual disturbance of soil, leading to altered floral habitats, erosion, and sedimentation;
- Impact on floral diversity as a result of possible uncontrolled fires;
- Potential spreading of alien invasive species as a result of floral disturbance; and
- Failure to initiate a rehabilitation plan and alien control plan during the construction phase may lead to further impacts during the operation phase.

### 13.2.6 Fauna

The project may result in the following impacts on the faunal environment during the operation phase:

- Migration of fauna from the prospecting area due to noise as a resulting of drilling activities;
- Loss of faunal species due to collisions with vehicles and machinery;
- Loss of faunal diversity and ecological integrity as a result of poaching and faunal species trapping;
- Failure to initiate a rehabilitation plan and alien control plan during the operation phase may lead to further impacts during the operation phase.

### 13.2.7 Soils, Land Use and Land Capability

The use of vehicles during the drilling of the exploration boreholes may result in the spillages of hydrocarbons from the vehicles and machinery. This will result in the contamination of soils. The material from the drilling site may result in the contamination of soils, which may render the land not usable after backfilling operation.

### 13.2.8 Air Quality

The movement of vehicles and drilling machinery will likely result in an increase in nuisance dust, $PM_{10}$ and $PM_{2.5}$. There is also potential for increase in carbon emissions and ambient air pollution due to the movement of vehicles and construction machinery. It is expected that the implementation of dust suppressing mitigation measures will result in the reduction in nuisance dust.

### 13.2.9 Visual

The drill rigs and towers used during the drilling operation phase will be visible from nearby locations and will have visual impact on the local communities in close proximity to the prospecting area. According to the specialist visual impact assessment, the main digger will have the greatest significant visual impact. From a distance, the machinery housing appears to resemble a formal structure. The specialist recommended that the machinery be blocked from visually affecting populated areas.

In addition, visual impacts may also occur as a result of establishment of required buildings such as administrative buildings which would be visible from access roads.

### 13.2.10 Heritage, Archaeological Resources

The drilling operations may result in the destruction of the burial site and other heritage resources.

### 13.2.11 Palaeontology Impacts

Earth moving activities may result in the destruction of fossils (if any).

### 13.2.12 Ambient Noise

The use of vehicles and machinery may result in an increase in noise in the immediate vicinity of the project. The drilling and processing plant activities will also result in an increase in noise in the vicinity of the project.

### 13.2.13 Traffic

The movement of vehicles in the project area will result in an increase in traffic on the public roads.

### 13.2.14 Climate

The movement of vehicles and machinery may result in the production of carbon dioxide (Green House Gas), which may have an impact on the climate in the area.

### 13.2.15 Vibrations

Drilling ground vibrations may result in possible damage to infrastructure and private property.

The summary of the impact assessment during the operation phase is provided in Table 13-4.

**Table 13-4: Impact Assessment Table for the Operation Phase**

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | | | | | Consequence | | | Probability | | | |
| | | Severity | Spatial | Duration | Frequency: Activity | Frequency: Impact | Significance | Significance Rating | Management and Mitigation Measures | Severity | Spatial | Duration | Frequency: Activity | Frequency: Impact | Significance | Significance Rating |
| Socio-Economic | Operation may affect the day-to-day operation of the landowners hence result in direct impact on their livelihood. | 2 | 1 | 2 | 2 | 3 | 25 | Low (-) | Random and regular alcohol and drug testing shall be conducted on all personnel responsible for operating machinery and driving construction vehicles to ensure the safety of the public;<br>Drill sites shall be kept to a minimum;<br>Landowners shall be informed of the exact location of the drill sites and shall be privy to the drilling programme, indicating the days on which each site will be drilled; and<br>The time spent at each drill site shall be kept to a minimum. | 1 | 1 | 2 | 1 | 1 | 8 | Low (-) |
| | Uncontrolled access of private property during operation may result in conflict with affected landowners and occupiers. | 2 | 1 | 1 | 2 | 2 | 16 | Low (-) | Security and safety should be emphasized;<br>No construction workers shall be allowed to access private properties without the owner's knowledge and consent;<br>Access to private property and areas outside the designated operation areas shall be strictly prohibited. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| | Negative impact as a result of additional trucks on the roads, impacting on local communities' health and safety. | 3 | 3 | 2 | 1 | 2 | 24 | Low (-) | Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads;<br>Where possible the transportation of materials and rubbish shall be undertaken outside traffic peak hours to minimise inconveniencing residents;<br>The number of vehicles on the roads shall be kept to a minimum;<br>Materials transported on public roads must be covered. | 1 | 2 | 1 | 1 | 1 | 8 | Low (-) |
| | Negative impact on, local community health and safety due to potential influx of employees, the presence of job seekers, which may lead to prostitution and conflict with the local communities. Illegal informal settlement of job seekers in the area may exacerbate the situation. | 3 | 3 | 2 | 1 | 2 | 24 | Low (-) | Liaise with the SAPD and existing forums in order to implement effective crime prevention strategies; and<br>The applicant will ensure that as far as possible locals will be used during the operation of the prospecting project.<br>Recruitment will not be undertaken on site. | 1 | 2 | 1 | 1 | 1 | 8 | Low (-) |
| | Negative impacts on local communities and livestock and safety due to the presence of pits used for bulk sampling | 3 | 3 | 2 | 1 | 2 | 24 | Low (-) | Ensure adequate access control to the project site<br>Bulk sampling pits shall be located as far from private property as is possible to minimise damage to infrastructure; | 1 | 2 | 1 | 1 | 1 | 8 | Low (-) |
| | As a result of drilling activities during operation, potential damage to adjacent landowner's/occupiers' infrastructure | 3 | 3 | 2 | 1 | 2 | 24 | Low (-) | Drill sites shall be located as far from private property as is possible to minimise damage to infrastructure;<br>Should private property be damaged due to operation activities, property owners shall be appropriately compensated. | 1 | 2 | 1 | 1 | 1 | 8 | Low (-) |
| | As a result of drilling, there is potential for the occurrence of subsidence, impacting on the safety surface land dwellers and users. | 3 | 3 | 2 | 1 | 2 | 24 | Low (-) | | 1 | 2 | 1 | 1 | 1 | 8 | Low (-) |
| Groundwater | The use of vehicles during the drilling of the exploration boreholes may result in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination of the vegetation cover and soils. The material removed from the drilling exercises will contain carbonaceous material, which has a potential for pollution should it be allowed stay for a prolonged period at the drilling site. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | Ensure that the drilling of the exploration boreholes is conducted in such a manner that the environment is protected from probable spillages and contamination.<br>All boreholes and sumps will be rehabilitated to pre-drilling conditions.<br>Tarpaulins will be placed on the ground to prevent oil, grease, hydraulic fluid, and diesel spills during emergency repairs.<br>All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste disposal facility. | 2 | 1 | 2 | 1 | 2 | 15 | Low (-) |
| | Storage of hydrocarbons and chemicals, which may impact on groundwater as a result of spillages and uncontrolled release. | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) | All waste generated from the drilling sites and the campsite will be collected in proper receptacles and removed to a registered disposal facility e.g., sewage treatment plant, sold waste disposal site or hydrocarbon recycling or treatment facilities. | 2 | 1 | 2 | 1 | 2 | 15 | Low (-) |
| | The seepage of contaminated water in the slimes dams can also result in groundwater pollution. | 3 | 2 | 3 | 3 | 3 | 48 | Medium High (-) | Groundwater monitoring must be undertaken upstream and downstream of the slimes dams to determine any groundwater quality impacts | 3 | 2 | 2 | 2 | 2 | 28 | Medium Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | Management and Mitigation Measures | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | | Severity | Spatial | Duration | Frequency: Activity | | | |
| | The prospecting operations will require the drilling of boreholes. The boreholes may result in the drawdown, which may affect the yield to the surrounding groundwater users. Material used for backfilling may leach pollutants that will result in the pollution of the surrounding groundwater regime. This may even spread beyond the backfilling site via plume migration. | 2 | 2 | 2 | 2 | 2 | 24 | Low (-) | Ensure that the landowners' borehole yields are monitored during the drilling operation.<br>Should it be proven that the operation is indeed affecting the quantity and quality of groundwater available to users and surrounding water resources, the affected parties must be compensated. | 2 | 1 | 2 | 1 | 2 | 15 | Low (-) |
| Surface Water and Hydrology | The drilling operations may result in the generation of surface water runoff contaminated with drilling muds and cuttings should spillages occur. The sedimentation and possible contamination with carbonaceous material will have negative impacts on the surrounding clean water environment. These will cause an increase in the turbidity and will decrease acidity of the water in the streams, which will affect the aquatic habitat, hence important habitats may be lost. | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (-) | No prospecting operations will be undertaken within 100 metres from the nearby steams and 500 meters from wetland areas without authorisation from the DWS;<br>Sumps will be excavated for the collection mud and excess water from the drilling sites;<br>The sumps will be sized such that they will be able to contain the water and mud that will be generated during the prospecting operation;<br>Storm water generated around the drilling site will be diverted away to the clean water environment;<br>No concrete mixing and vehicle maintenance will be allowed on site.<br>All hydrocarbons will be stored on protected storage areas away from the streams. | 2 | 1 | 2 | 1 | 2 | 15 | Low (-) |
| | Impact of the Removal and Alteration of Natural Water Courses on Catchment Response: The proposed shallow pits have not yet been determined; however, it will certainly cover a significant portion of the proposed project area. Inevitably, certain existing non perennial water courses that collect and convey surface water runoff to drainage lines and wetlands would be removed or altered. | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (-) | Where prospecting infrastructure, such as roads, are required across natural water courses, new stormwater infrastructure, such as pipes and culverts could replace the hydraulic function currently offered by the natural water courses. This infrastructure should be designed for both hydraulic performance and environmental functionality. A thorough assessment of the suitability of the new stormwater infrastructure must be made at the preliminary design stage.<br>The water quality of the drainage lines and wetlands adjacent to the project site should be monitored monthly as described in the operational management plan. | 2 | 1 | 2 | 1 | 2 | 15 | Low (-) |
| | Positive Impact of Reduced Peak Runoff and Discharge Volumes on Water Courses: The proposed prospecting development would require construction of Prospecting and bulk sampling with pits and trenches; Ablution facility; Access roads; Diesel storage; Office site; Plant site; Slimes dam; Office Area; and Vehicle parking area. Being classified as "dirty," rain falling on this infrastructure would be captured and contained. Consequently, the quantum of surface water runoff would reduce. | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (+) | As the impact is deemed Positive, no mitigating measures were proposed. | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (+) |
| | Impact of Reduction in Mean Annual Runoff on Downstream Surface Water Resources | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (-) | As it is extremely unlikely that the open pits could be relocated or reduced in extent, other possible solutions must be found. This water would replace the lost MAR and provide artificial replenishment which is needed due to the not so good water quality (muddy) at the drainage lines and wetlands. | 2 | 1 | 2 | 1 | 2 | 15 | Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | Management and Mitigation Measures | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | | Severity | Spatial | Duration | Frequency: Activity | | | |
| | Impact of Increased Sediment Yield on Surface Water Quality :the erosion potential of the local soils, it is likely that the construction and operational phases of the proposed development would cause an increase in erosion. Thus, an increase in sediment deposition could be expected at the drainage lines and wetlands. To limit the environmental impact on faunal and floral communities, sediment yield must be reduced as far as possible. Sediment load is measured in terms of Total Suspended Solids (TSS), but through the effective design and deliberate implementation of BMP "treatment trains, its impact can be mitigated | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (-) | Pollution control dams should be constructed to contain surface water runoff from all dirty areas, such as waste rock stockpiles. Dirty runoff should be directed toward the processing plant area through a well-designed system of berms and channels.<br>The runoff from bare areas, such as haul roads, would need to be collected and conveyed by adequate side drains. This water, which would be high in TSS content, should be attenuated and retained sufficiently to allow sediment to settle prior to the discharge of the sufficiently clean supernatant;<br>Dust mitigation should be implemented.<br>The quality of runoff in watercourses during the rainy season should be monitored and corrective actions taken as appropriate.<br>During the decommissioning phase, all unnecessary bare surfaces and developed zones should be removed and, as far as is possible, restored to their natural state | 2 | 1 | 2 | 1 | 2 | 15 | Low (-) |
| | Impact of Increased Pollutant Load on Surface Water Quality | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (-) | A thorough, regular inspection and maintenance regime should be implemented for the ablution area and facilities;<br>Pump stations should be inspected, serviced, and cleaned monthly, and manholes and underground pipes inspected and cleaned every six months;<br>An emergency response unit should be established to undertake urgent maintenance and repair work after hours;<br>Surface water runoff from the dirty areas (e.g. waste rock stockpiles, tailings dam) must be captured and wherever possible, reused in the prospecting process. Pollution control dams should be deployed. Dirty runoff should be directed towards these process area through a well-designed system of berms and channels;<br>All areas where hydrocarbons, such as oils and petroleum fuels are handled (i.e. workshops should be bunded and strictly controlled to minimize the risk of accidental spillages;<br>Water quality of runoff into the drainage lines and wetlands should be monitored monthly and corrective actions taken as appropriate. | 2 | 1 | 2 | 1 | 2 | 15 | Low (-) |
| Aquatic Ecology and Wetlands | During the operational phase of the prospecting area rainfall is likely to filter through into the project waste, This water is likely to accumulate particles and pollutants that will pose a risk to the surrounding watercourses. Sediment that washes off the project site during periods of rainfall will also contribute to increased sedimentation in the aquatic environment. Erosion and sedimentation impacts are linked to alterations in hydrological regimes as a result of increased storm water flood peaks associated with increased impermeable surfaces and the concentration of flows. Increases in peak discharge may significantly increase stream power, increasing the risk of erosion (localised scouring and incision) and resultant sedimentation of watercourses. Local site factors such as soil erodibility, vegetation cover, gradient of local slopes and regional rainfall/runoff intensity will affect the probability and intensity of erosion impacts (Macfarlane et al., 2014). | 3 | 2 | 3 | 3 | 3 | 48 | Medium High (-) | No drilling shall be allowed within wetlands and associated 32m buffer areas<br>Adequate stormwater management must be incorporated into the design of the project in order to prevent erosion and the associated sedimentation of the aquatic system;<br>Riparian vegetation bordering on drainage lines, wetlands and rivers will be considered environmentally sensitive and impacts on these habitats should be avoided.<br>No releases of any substances that could be toxic to fauna or faunal habitats within the channels or any watercourses is permitted.<br>Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed, and the affected area rehabilitated immediately.<br>Education of workers is key to establishing good pollution prevention practices. Training programs must provide information on material handling and spill prevention and response, to better prepare employees in case of an emergency.<br>Signs should also be placed at appropriate locations to remind workers of good housekeeping practices including litter and pollution control.<br>The proper storage and handling of hazardous substances (hydrocarbons and chemicals) needs to be ensured. All employees handling fuels and | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | Management and Mitigation Measures | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | | Severity | Spatial | Duration | Frequency: Activity | | | |
| | Pollution of water resources and soil Changes to the water quality will result in changes to the ecosystem structure and function as well as a potential loss of biodiversity. Water quality pollution leads to modification of the species composition where sensitive species are lost and organisms tolerant to environmental changes dominate the community structure. Any substances entering and polluting watercourses will directly impact downstream ecology through surface runoff during rainfall events, or subsurface water movement, particularly during the wetter summer months. | 3 | 2 | 3 | 3 | 3 | 48 | Medium High (-) | other hazardous materials are to be properly trained. Storage containers must be regularly inspected so as to prevent leaks.<br>All contractors and employees should undergo induction which is to include a component of environmental awareness.<br>No prospecting activities and access to wetlands and associated 32m buffer is permitted.<br>No drilling activities shall be allowed within 500 m of wetland areas without consent from the DWS;<br>No vehicles may be allowed to indiscriminately drive through the wetland areas or within the active stream channels;<br>All disturbed areas shall be re-vegetated with indigenous species;<br>All construction materials shall be kept out of the wetland areas;<br>Implement a programme for the clearing/eradication of alien species including long term control of such species;<br>Wetland monitoring and biomonitoring must take place bi-annually.<br>All vehicles shall be regularly inspected for leaks. Re-fuelling must take place outside the project area, on a sealed surface area to prevent ingress of hydrocarbons into topsoil and aquatic ecosystems<br>Do not allow surface water or stormwater to be concentrated, or to flow down cut or fill slopes without erosion protection measures being in place.<br>Exposed soils must be rehabilitated as soon as practically possible to limit the risk of erosion. Erosion control measures must be employed where required. | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (-) |
| | Alien Invasive Species: There are alien invasive plant species currently present within the area. Any ground disturbance provides an opportunity for alien invasive plant species to spread and for new species to establish themselves in the areas. Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and "quality" of species), change nutrient cycling and productivity, and modify food webs (Zedler & Kercher, 2004). Such changes on the ecology of the riparian habitat have/will have a detrimental impact on its ability to maintain both floral and faunal biodiversity. | 3 | 2 | 3 | 3 | 3 | 48 | Medium High (-) | | 2 | 2 | 2 | 2 | 3 | 30 | Medium Low (-) |
| Biodiversity | Continued destruction of potential floral habitats for species of conservational concern as a result continual disturbance of soils leading to altered floral habitats, erosion, and sedimentation. | 2 | 1 | 3 | 2 | 2 | 24 | Low (-) | All disturbed areas must be rehabilitated in tandem with construction activities.<br>The collection of any plant material for firewood or medicinal purposes shall be strictly prohibited.<br>The existing integrity of flora surrounding the study area shall be upheld and no activities shall be carried out outside the footprint of the demarcated drill sites. | 2 | 1 | 1 | 1 | 1 | 8 | Low (-) |
| | Impact on floral species of conservational concern as a result of an increased in alien species proliferation and ineffective rehabilitation of exposed areas | 2 | 1 | 3 | 2 | 2 | 24 | Low (-) | | 2 | 1 | 1 | 1 | 1 | 8 | Low (-) |
| | Loss of faunal habitat and ecological structure as a result of increased fires during operation and introduction of alien species, leading to transformation of the natural habitat | 2 | 1 | 3 | 2 | 2 | 24 | Low (-) | The rehabilitation of the disturbed areas must be conducted such that the rehabilitated areas will encourage the migration of animals back into the rehabilitated areas.<br>The proposed development footprint areas shall remain as small as possible and where possible be confined to already disturbed areas.<br>No trapping or hunting of fauna shall be permitted.<br>Edge effects of all operational activities, such as erosion and alien plant species proliferation, which may affect faunal habitat shall be strictly managed.<br>No informal fires in the vicinity of drill sites shall be permitted.<br>An alien vegetation control plan must be implemented in order to manage alien plant species occurring within the study area, and to prevent further faunal habitat loss.<br>Poaching of wild animals and livestock will be prohibited. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| Soils Land use and Land Capability | Topsoil removal, storage, and replacement during the excavation of the sumps will result. This will result in the disruption of the soils profile. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) | Ensure that topsoil is properly stored, away from watercourses.<br>The soils must be used for the backfilling and rehabilitation of the sumps. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | Management and Mitigation Measures | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | | Severity | Spatial | Duration | Frequency: Activity | | | |
| | Soil contamination as a result of operational activities can be as a result of a number of activities (i.e. hazardous substance storage, incidental hydrocarbon leakages from construction vehicles). | 3 | 1 | 2 | 2 | 2 | 24 | Low (-) | The rehabilitated sump must be seeded with recommended seed mix consisting of indigenous species.<br>Tarpaulins will be placed on the ground to prevent oil, grease, hydraulic fluid, and diesel spills during emergency repairs.<br>Soil disturbance within the drill sites shall be kept to a minimum. | 2 | 1 | 1 | 1 | 1 | 8 | Low (-) |
| Air Quality | The prospecting operation will require vehicular movement which may result in Possible increase in dust generation, PM10 and PM2.5 as a result of stockpiling material, use of heavy machinery, and material movement. | 2 | 3 | 2 | 2 | 2 | 28 | Medium Low (-) | Dust suppression must be conducted during the operational phase of the project.<br>Correct speed will be maintained at the proposed project site.<br>Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes.<br>Where practical possibly rehabilitation should be undertaken progressively.<br>A speed limit of 40 km/hr shall apply to limit vehicle entrained dust from the unpaved roads.<br>All construction equipment must be scheduled for preventative maintenance to ensure the functioning of the exhaust systems to reduce excessive emissions and limit air pollution.<br>Dust control suppression shall be implemented on dry weather days and periods of high wind velocities;<br>Appropriate dust suppression measures may include limiting the extent of open areas, reducing the frequency of disturbance, and spraying with water;<br>Materials transported on public roads must be covered; and<br>Where practical rehabilitation should be undertaken progressively.<br>*Odours*<br>Putrescible waste must be handled, stored, and disposed of before the probability of it generating odours; and<br>Chemical toilets must be emptied / serviced on a regular basis. Proof of this must be provided to the Engineer. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| | Increase in carbon emissions and ambient air pollutants (NO2 and SO2) as a result of movement of vehicles and operation of machinery/equipment. | 2 | 3 | 2 | 2 | 2 | 28 | Medium Low (-) | | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| Visual | The drill rigs and towers used during the drilling operations will be visible from the nearby Hotazel residents and properties. | 2 | 2 | 3 | 2 | 3 | 35 | Medium Low (-) | Ensure that the time period used for the drill rigs is optimised to ensure that the drill rigs are moved from one site to another over short periods<br>Materials transported on public roads must be covered.<br>Raise the view range for parts where the digger will operate. Visually looking at a mound with trees will mitigate any form of visual impact on the site. It is a flat site so from a specific range the project should not be visible to its immediate surroundings.<br>Create buffer zones in the affected area. Rehabilitate the buffers, plant trees, and create a visual barrier between the affected area and the prospecting operation. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| | Visual impacts due to the structures erected on the formal structure which may be visible from access road | 2 | 2 | 3 | 2 | 3 | 35 | Medium Low (-) | Ensure the administrative buildings and access roads have appropriate landscaping techniques | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| | The use of lighting around the project area and access roads will result in visual impacts | 2 | 2 | 3 | 2 | 3 | 35 | Medium Low (-) | The use of mast lights should be avoided.<br>All light sources should be directed downwards.<br>Light sources should be shielded were appropriate | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| Heritage Resources | The drilling operation may result in the destruction of graves and any other heritage sites during operational phase of the project. | 3 | 2 | 2 | 1 | 2 | 21 | Low (-) | Locate exploration borehole more than 100 m from the identified burial/burial site.<br>Should any archaeological or physical cultural property heritage resources be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped until heritage authority has cleared the development to continue.<br>Should any archaeological, cultural property heritage resources be exposed during excavation or be found on development site, a registered heritage specialist or PHRA official must be called to site for inspection. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | Management and Mitigation Measures | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | | Severity | Spatial | Duration | Frequency: Activity | | | |
| | | | | | | | | | Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed form site;<br>Should remains and/or artefacts be discovered on the development site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Construction Manager who in turn will inform Northern Cape PHRA<br>Should any remains be found on site that is potentially human remains, the Northern Cape PHRA and South African Police Service should be contacted. | | | | | | | |
| Palaeontological Resources | Drilling of exploratory boreholes has potential to impact on palaeontological resources | 2 | 1 | 2 | 2 | 1 | 20 | Low (-) | Should fossils be exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.<br>If any palaeontological material is exposed during digging, excavating, drilling, or blasting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| Noise | The use of vehicles and machinery during the construction phase may generate noise in the immediate vicinity | 2 | 2 | 3 | 2 | 3 | 35 | Medium Low (-) | Ensure that proper management measures as well as technical changes are undertaken to reduce the impacts on surrounding residents and employees. This include ensuring that less noisy equipment is used, that equipment is kept in good working order and that the equipment must be fitted with correct and appropriate noise abatement measures and where possible use white-noise generators instead of tonal reverse alarms on heavy vehicles operating on roads.<br>Quarterly monitoring of work zone noise and outside area should be conducted to determine any noise impacts (all receptor points identified and if a residential dwelling will be established for workers during operation)<br>Adjacent landowners must be advised of any work that will take place outside of normal working hours, that may be disruptive (e.g. noise) in advance.<br>Surrounding communities must be notified in advance of noisy construction activities.<br>All equipment should be provided with standard mufflers.<br>Muffling units on vehicles and equipment must be kept in good working order.<br>Construction staff working in areas where the 8-hour ambient noise levels exceed 85 Dba should wear ear protection equipment.<br>Where possible, operation of several equipment and machinery must be avoided;<br>All equipment must be kept in good working order, with immediate attention being paid to defective silencers, slipping fanbelts, worn bearings and other sources of noise;<br>Equipment must be operated within specifications and capacity (e.g. no overloading of machines);<br>Regular maintenance of equipment must be undertaken, particularly with regard to lubrication;<br>Equipment shall be switched off when not in operation;<br>Appropriate directional and intensity settings must be maintained on all hooters and sirens;<br>The Contractor must ensure that the employees conduct themselves in an appropriate manner while on site;<br>Adjacent landowners shall be notified in writing if work needs to be carried out after hours or if any blasting will be required; and<br>Noise/vibration producing activities shall be limited to daylight hours (Monday to Friday 07H00 to 17H00 and Saturday 07H00 -14H00). | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| | Increase in ambient noise levels as a result of the drilling activities. | 2 | 2 | 3 | 2 | 3 | 35 | Medium Low (-) | | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating | Management and Mitigation Measures | Consequence | | | Probability | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | | Severity | Spatial | Duration | Frequency: Activity | | | |
| Traffic | Increase in traffic volumes as a result of pre-construction activities which may lead to an increase in traffic congestion on the public roads as well as the farm roads around the prospecting area. | 2 | 3 | 1 | 2 | 2 | 24 | Low (-) | Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads; and<br>Where possible the transportation of construction materials and rubbish shall be undertaken outside traffic peak hours to minimise inconveniencing residents. | 1 | 2 | 1 | 1 | 1 | 8 | Low (-) |
| Climate | Emissions of Green House Gases as a result of the use of plant, heavy moving machinery, generators etc. | 2 | 2 | 2 | 2 | 2 | 24 | Low (-) | The number of construction vehicles and trips shall be kept to a minimum<br>All the vehicles shall undergo maintenance on a regular basis to improve on the combustion engine vehicle efficiency. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| Drilling and Vibrations | Impact of drilling ground vibration on houses, boreholes, and roads, resulting in possible damage to infrastructure | 2 | 1 | 1 | 2 | 2 | 16 | Low (-) | Drill sites shall be located as far from private property as is possible.<br>Affected property owners shall be notified of any drilling activities before commencement of the activities. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| | Fly rock impact on houses, boreholes, and roads, resulting in possible damage to infrastructure; | 2 | 1 | 1 | 2 | 2 | 16 | Low (-) | Should there be damage to private property as a result of drilling activities, property owners shall be appropriately compensated. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |
| Waste Management | Potential water and soil pollution as a result of inappropriate waste management practices. | 2 | 1 | 1 | 2 | 2 | 16 | Low (-) | *Storage of waste*<br>General waste will be collected in an adequate number of litter bins located throughout the construction site;<br>Bins must have lids in order to keep rainwater out;<br>Bins shall be emptied regularly to prevent the bins from overflowing;<br>All work areas shall be kept clean and tidy at all times;<br>All waste management facilities will be maintained in good working order;<br>Waste shall be stored in demarcated areas according to type of waste;<br>Runoff from drill sites will be contained, treated, and reused;<br>Flammable substances must be kept away from sources of ignition and from oxidizing agents;<br>No storage of waste shall be permitted within 100 m of the water courses or within 500 m of wetland areas;<br>Demolition waste and surplus concrete shall be disposed of responsibly;<br>Waste shall not be buried or burned on site; and<br>The maximum retention time for temporary storage of waste generated shall not exceed 30 days, provided the waste does not present a health hazard or risk of odour.<br>*Disposal of hazardous waste*<br>No dumping shall be allowed in or near the construction site;<br>Hazardous containers shall be disposed of at an appropriate licensed site;<br>Hazardous waste will be removed and managed by an approved service provider;<br>A safe disposal certificate will be provided by the approved service provider as proof of responsible disposal of hazardous waste; and<br>The safe disposal certificate shall be stored and provided on request.<br>*Disposal of general waste*<br>No dumping shall take place in or near the drill sites; and<br>All general waste shall be disposed of to the nearest licensed landfill site. | 1 | 1 | 1 | 1 | 1 | 6 | Low (-) |

## 13.3 Decommissioning and Closure

It is expected that the impacts for the decommissioning and closure phases will be similar to the impacts during the construction phase and have not been assessed in detail (please refer to the construction phase assessment). The most significant impacts will be:

### 13.3.1 Soils and Land Capability

The removal of the campsite equipment and the rehabilitation of the drilling sites and associated access infrastructure will result in the affected soil and land use being restored. This will also result in the resumption of the use of the land since the infrastructure would have been removed. However, should the rehabilitation of affected sites not be conducted properly, it may result in loss of usable soils and agricultural land, resulting in reduced land capability.

### 13.3.2 Land Use

Positive impacts will result due to the reduction in areas of disturbance and the return of land use of the affected areas and making available areas that were covered by the campsite, and drilling sites.

### 13.3.3 Soils and Vegetation

The use of vehicles/machinery during the rehabilitation of the exploration sites may result in the compaction of soils and in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination and destruction of the vegetation cover, soils, and groundwater.

### 13.3.4 Surface Water and Aquatic Ecosystems

During the decommissioning and closure phases equipment will be removed, stockpiled soils will be used for rehabilitation, remaining sumps will be backfilled, levelled, top soiled and the area re-seeded. During the process of rehabilitation surface water runoff from the rehabilitation site may have elevated silt load, which may cause pollution of water courses and wetlands.

### 13.3.5 Air Quality

Rehabilitation and removal of the prospecting sites and equipment will require vehicular movement. This will result in the generation of dust by movement of vehicles and due to blowing winds. Vehicles and machinery will also generate diesel or petrol fumes. Generated dust will migrate towards the predominant wind direction and may settle on surrounding properties including nearby vegetation.

### 13.3.6 Noise

Noise will be generated during the removal of equipment and rehabilitation of the sites. The noise is not expected to exceed occupational noise limits and will be short lived.

The summary of the impact assessment during the decommissioning and closure phase is provided in Table 13-5.

**Table 13-5: Impact Assessment Table for the Decommissioning and Closure Phase**

| Environmental Aspect | Nature of potential impact/risk | Environmental Impact Significance Before Mitigation | | | | | | | Impact Management Actions (Proposed Mitigation Measures) | Environmental Impact Significance After Mitigation | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Consequence | | | Likelihood (Probability) | Frequency: Impact | Significance | Significance Rating | | Consequence | | | Likelihood (Probability) | Frequency: Impact | Significance | Significance Rating |
| | | Severity | Spatial | Duration | Frequency: Activity | | | | Management and Mitigation Measures | Severity | Spatial | Duration | Frequency Activity | | | |
| Soils, Land Capability and Land Use | The removal of the campsite equipment and the rehabilitation of the drilling sites and associated access infrastructure will result in the affected soil and land use being restored. This will also result in the resumption of the use of the land since the infrastructure would have been removed. | N/A | N/A | N/A | N/A | N/A | 0 | N/A | Ensure that contamination of the rehabilitate area by hydrocarbon liquids is prevented.<br>Ensure that the rehabilitation work is done in such a manner that the environment is protected from probable spillages.<br>All boreholes and sumps will be rehabilitated to pre-drilling conditions.<br>Tarpaulins will be placed on the ground to prevent oil, grease, hydraulic fluid, and diesel spills during emergency repairs.<br>All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste disposal facility.<br>All waste generated from the rehabilitation sites will be collected in proper receptacles and removed to registered disposal facilities e.g., sewage treatment plant, sold waste disposal site or hydrocarbon recycling or treatment facilities. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Land Use | Positive impacts will result due to the reduction in areas of disturbance and the return of land use of the affected areas and making available an area that was covered by the campsite and drilling sites. | N/A | N/A | N/A | N/A | N/A | 0 | N/A | | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Soils and Vegetation | The use of vehicles/machinery during the rehabilitation of the exploration sites may result compaction of soils and in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination and destruction of the vegetation cover and soils. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) | | 1 | 1 | 2 | 1 | 2 | 12 | Low (-) |
| Surface water and aquatic ecosystem | During the decommissioning and closure phases equipment will be removed, stockpiled soils will be used for rehabilitation, remaining sumps will be backfilled, levelled, top soiled and the area re-seeded. During the process of rehabilitation, surface water runoff from the rehabilitation site may have elevated silt load, which may cause pollution of the nearby water environment. | 2 | 3 | 2 | 2 | 2 | 28 | Medium Low (-) | Ensure that water leaving the site does not have elevated silt load.<br>Adequate stormwater management shall be conducted on site to ensure that dirty water is kept separate from clean water.<br>Ensure that the rehabilitated areas are free draining and that water from these areas is clean. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) |
| Air Quality | Rehabilitation and removal of the prospecting sites and equipment will require vehicular movement. This will result in the generation of dust by movement of vehicles and due to blowing winds. Vehicles and machinery will also generated diesel or petrol fumes. Generated dust will migrate towards the predominant wind direction and may settle on surrounding properties including nearby vegetation. | 1 | 3 | 2 | 2 | 2 | 24 | Low (-) | Dust suppression must be conducted during the decommissioning phase of the project whenever excessive dust is generated.<br>Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes. | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |
| Noise | Noise will be generated during the removal of equipment and rehabilitation of the sites. This noise is not expected to exceed occupational noise limits and will be short lived. | 2 | 1 | 2 | 2 | 2 | 20 | Low (-) | Where necessary, provide employees with ear plugs and employees must be instructed to use the ear plugs.<br>Ensure that equipment is well maintained and fitted with the correct and appropriate noise abatement measures. | 1 | 1 | 1 | 1 | 2 | 9 | Low (-) |

## 13.4 Cumulative Impacts

Incomparable activities can result in several complex effects on the natural biophysical and social environment. These impacts are mainly identified as direct and immediate effects on the environment by a single entity affecting a variable of the environment. These direct impacts have the potential to combine and interact with other activities, depending on the surrounding environmental state and land use. These impacts may aggregate or interact with other impacts to cause additional effects, not easily quantified when assessing an individual entity.

The NEMA, 2014, specifically requires that cumulative impacts be assessed. This section provides a description and analysis of the potential cumulative effects of the proposed prospecting project , and past and present projects hereby considering the effects of any changes on the:

- Biophysical; and
- Socio – Economic conditions.

For the analysis of cumulative effects to be utilised as a useful tool for decision makers and I&APs, it must be limited to the effects that can be meaningfully evaluated, rather that expanding on resources or receptors that are no longer affected by the development or are not of interest to the I&APs. Two important aspects require consideration prior to the evaluation of cumulative effects:

- The determination of an appropriate spatial and temporal boundaries for evaluation of cumulative effects of the project; and
- The evaluation of relevant projects for consideration in the cumulative effects' analysis.

Spatial and temporal boundaries for analysis of cumulative effects are dependent on several factors, including:

- The size and nature of the project and its potential effects;
- The size, nature, and location of past and (known) future projects and activities in the area,
- The aspect of the environment impacted by the cumulative effect; and
- The period of occurrence of effects.

The spatial extent of the cumulative impact analysis is generally aligned with the zone of influence of the project and other projects in the vicinity. Most impact will be localised; however, others may be experienced on a regional scale. This is taken into consideration during the assessment of cumulative impacts. It is reasonably straightforward to identify significant past and present projects and activities that may interact with the proposed prospecting project to produce cumulative impacts, and in many respects, these are taken into account in the descriptions of the biophysical and socio- economic baseline.

### 13.4.1 Geohydrological and Surface Water Impacts

The potential groundwater and surface water quality impacts associated with the construction and operation of the proposed prospecting project relate to the potential contamination because of leakages from vehicles and machinery as well as potential overflow of the infrastructure and seepage of contaminated water from waste disposal sites and waste rock dumps. Mitigation

measures have been proposed for the impacts on ground water and surface water contamination. It is expected that with the implementation of the mitigation measures the impacts will be reduced to an acceptable level. The hydrological and surface water cumulative impacts resulting from the construction and operation of the proposed prospecting project will be negligible.

### 13.4.2 Air Quality Impacts

Most of the land use in the vicinity of the proposed prospecting area is mostly agriculture in nature, with a residential area located in close proximity to the area. The potential air quality impacts associated with the construction and operation of the proposed prospecting project relate to the potential generation of $PM_{2.5}$, $PM_{10}$ and fugitive dust emissions because of vehicular movements as well as prospecting activities.

Mitigation measures have been proposed to mitigate these adverse impacts. It is expected that the implementation of these mitigation measures will reduce this impact to an acceptable standard and that the cumulative air quality impacts from the construction and operation of the project will be negligible.

### 13.4.3 Noise Impacts

The potential noise nuisance associated with the construction and operation of the prospecting project relates to the movement of vehicles and operation of machinery on site as well as operation of the project. Mitigation measures have been proposed to avoid and/or reduce the nuisance noise impacts. It is expected that with the implementation of the mitigation measures this impact will be reduced to an acceptable level.

### 13.4.4 Heritage Resources

The proposed prospecting combined with other proposed project activities will eventually transform the landscape should the proposed prospecting proceed to mining phase. The cumulative impact will negatively affect the landscape quality of the area should the proposed PRA proceed to mining. The frequency of development proposals in the area has a potential of collectively changing the character of the landscape. However, the proposed prospecting has very low impacts on heritage resources compared to actual mining. As such the cumulative impact of the proposed prospecting is expected to be very low given that the project area is known to have very low occurrence of archaeological remains. In addition, prospecting will also have very low impact from a visual perspectives.

### 13.4.5 Wetlands

Cumulative impacts are activities and their associated impacts on the past, present, and foreseeable future, both spatially and temporally, considered together with the impacts identified in Section 13.2.4 and Section 13.3.4. Freshwater ecosystems are under continued pressure from activities such as development of residential developments (Rietfontein), agricultural activities and mining related activities which further impact on their ecological integrity and ecological functioning. These various developments have also resulted in loss of freshwater habitat and infilling of the wetlands within the study area will also result in cumulative impacts in the area.

It is therefore expected that cumulative impacts associated with the loss of freshwater habitat and vegetation removal will occur. As such, it is considered important that mitigation measures

are implemented and the 32m buffer area strictly enforced to avoid and/or minimise potential edge effects on the wetlands.

### 13.4.6 Biodiversity

The proposed project and associated infrastructure will place additional pressure on the environment especially on the fauna; that will be subjected to increased human presence, reduction in habitat and elevated noise levels. The results of the fauna survey indicate that fauna activity within the area might decline as a result of the current activities around the area. Further to this, the cumulative loss of fauna and flora is expected.

### 13.4.7 Visual

A cumulative impact assessment of the proposed prospecting is considered within the context of similar land uses within the study area. According to the specialist visual impact assessment, there is no cumulative impact associated with the proposed prospecting activity.

### 13.4.8 Traffic

There will be additional traffic during the construction and operational phase of the project due to transportation of materials. This will contribute to the cumulative traffic impacts which are expected to be of low significance. The implementation of mitigation measures contained in this report and accompanying EMPr will reduce the significance of the cumulative impacts even further.

## 13.5 Residual Impacts

A residual environmental effect is an environmental impact of a project that remains, or is predicted to remain, after mitigation measures have been implemented.

### 13.5.1 Surface water and Hydrology

According to the hydrology specialist study, should the identified mitigation measures be implemented, the anticipated decrease in water quality attributable to increased pollutant load could be greatly reduced. Accordingly, the impact significance on drainage lines and wetlands downstream could be classified as minor during the construction and operation phases of the project, and negligible significance during the decommissioning phase.

### 13.5.2 Visual

The identified impacts will be experienced at the end of the project even after rehabilitation. The natural environment and people will slowly adjust to the new normal until the conditions improve with time.

### 13.5.3 Biodiversity

The expected residual impacts will include:

- Permanent loss of and altered floral species diversity;
- Permanent loss of protected floral species and suitable habitat for such species;
- Disturbed areas are not rehabilitated to an ecologically functioning state with resulting loss of floral habitat and species diversity likely to be permanent;
- Altered faunal species diversity;

- Potential continued loss of faunal SCC;
- Potential loss of faunal abundance in the local area; and
- Disturbed areas are highly unlikely to be rehabilitated to baseline levels of ecological functioning and loss of faunal habitat and species diversity will most likely be long term.

# 14 Possible mitigation measures that could be applied and the level of risk

Refer to Section 13 for the mitigation measures that could be applied to reduce the level of risk due to the proposed prospecting project. It is anticipated that the management measures associated with the activities will be adequate to manage the impacts associated with the project as provided in Section 13 of this report.

# 15 Motivation where no alternatives were considered

The location of the proposed project components is constrained to the location with potential for the mineral resources (Diamond (Alluvial and Kimberlitic), Sand, Gravel, Trace Gold reserves). The project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting. In addition few fragments of severely weathered kimberlite were collected during site visit within project area. This confirms kimberlite presence within target area. Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous. Gravels moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades.

As such, no property alternatives were viable to be considered for this project.

Since no complicated surface infrastructure will be required for this project no design and layout alternatives for the proposed project were determined.

The heritage resources and wetlands specialists have recommended buffer areas within which no project activities may be allowed so as to minimise and/or avoid impacts and edge effects on the burial site and wetlands in the area. The no-go areas are shown in Figure 15-1.

The applicant will ensure that the final layout of the project excludes activities in the no-go areas.

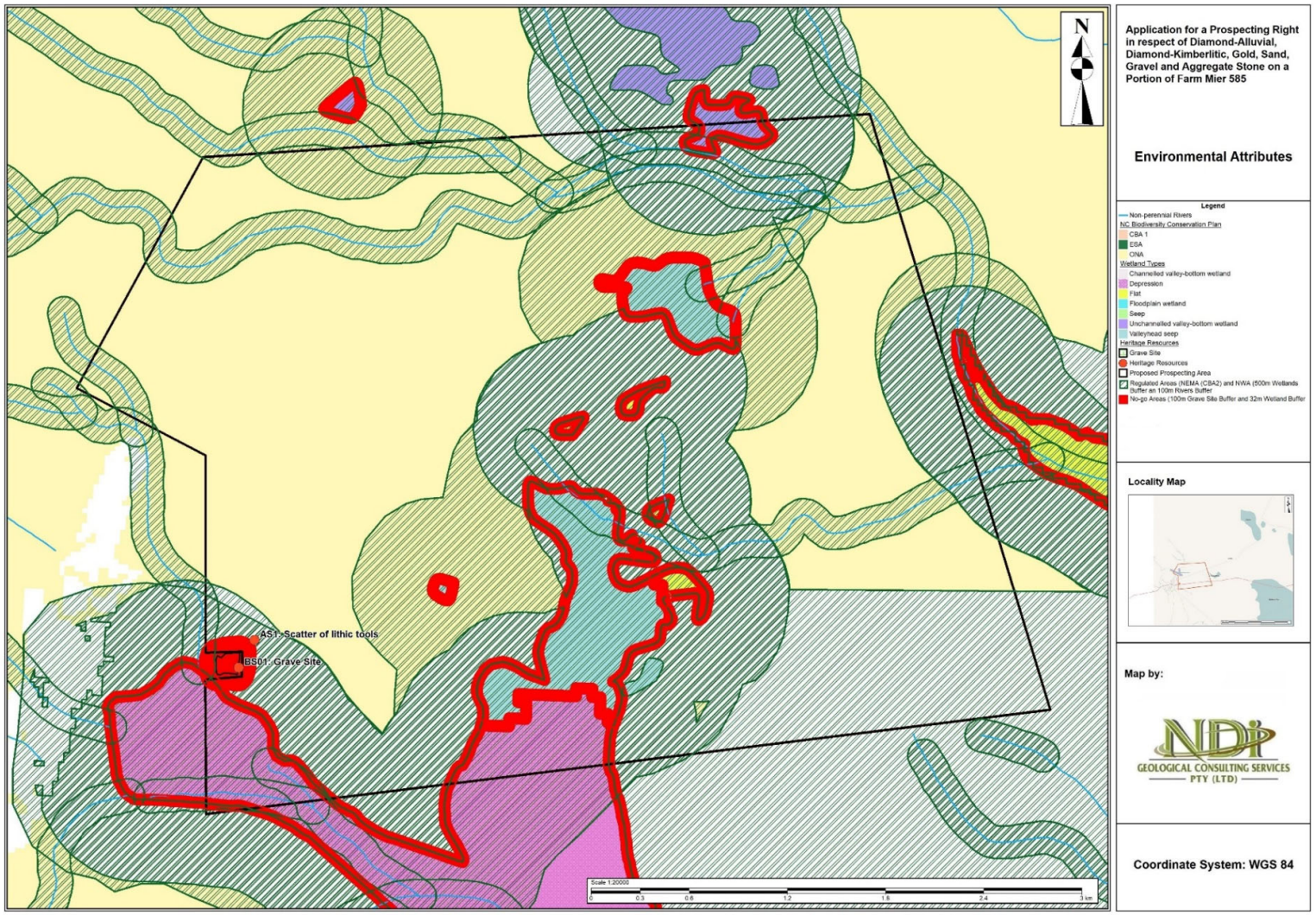



**Figure 15-1: Environmental No-Go Areas**

# 16 Statement motivating the preferred site

The location of the proposed project components is constrained to the location with potential for the mineral resources (Diamond (Alluvial and Kimberlitic), Sand, Gravel, Trace Gold reserves). The project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting. In addition few fragments of severely weathered kimberlite were collected during site visit within project area. This confirms kimberlite presence within target area. Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous. Gravels moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades.

For this reason, no site selection assessment was undertaken.

The heritage resources and wetlands specialists have recommended buffer areas within which no project activities may be allowed so as to minimise and/or avoid impacts and edge effects on the burial site and wetlands in the area. The no-go areas are shown in Figure 15-1.

The applicant will ensure that the final layout of the project excludes activities in the no-go areas.

# 17 Description of the process undertaken to identify, assess and rank the impact and risks the activity will have on the preferred site

In order to identify the potential impacts associated with the proposed prospecting activities, the following steps were undertaken:

- The stakeholder consultation process is currently being undertaken in a manner to be interactive, providing the landowners and identified stakeholders with an opportunity to provide input into the project. This is considered a key focus as the local residents have capabilities of providing site-specific information, which may not be available in desktop research material. Stakeholders were requested, as part of the notification letter, to provide their views on the project, and to state any potential concerns they may have. All comments and responses provide will be collated into the comments and responses table, which will be attached to the final EIA/EMPr Report and will also be incorporated into the final impact assessment.
- A detailed desktop study was undertaken to determine the environmental setting in which the project is located. Based on the desktop investigations, various resources were used to determine the significance and sensitivity of the various environmental considerations. The desktop investigation involved the use of:
    - The South African National Biodiversity Institute (SANBI) Biodiversity Geographic Database Land Use Decision Support (LUDS) System;
    - DWS information documents;
    - The Municipal IDP for the Municipality; and
    - The SDF for the District Municipality.
- Specialist studies were also undertaken for biodiversity, noise, visual, wetlands, palaeontology, surface water and hydrology as well as heritage resources.

A quantitative impact assessment process was undertaken as described in Sections 12.The rating of the identified impacts was undertaken in a quantitative manner as provided in Section 13 (impact rating). The ratings were undertaken in a manner to calculate the significance of each of the impacts. The identification of management and mitigation measures was done based on the significance of the impacts and measures included are considered sufficient, appropriate, and practical to protect the environment.

## 17.1 Assessment of each identified potentially significant impact and risk

The environmental impacts of prospecting are generally of low significance, short lived and can be mitigated to even lower levels of significance. Concurrent or progressive rehabilitation of disturbed areas is standard good practice and should be undertaken as it will reduce the project's environmental liability and costs at closure as rehabilitation is included in the operational activities of the project.

A detailed assessment of all the identified potential impacts is provided in Section 13.

# 18 Summary of Specialist Reports

The recommendations from specialist studies are summarised in Table 18-1.

**Table 18-1: Summary of specialist reports**

| LIST OF STUDIES UNDERTAKEN | RECOMMENDATIONS OF SPECIALIST REPORTS | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED. |
|---|---|---|---|
| Heritage Resources Assessment | The HIA made the following recommendations:<br>• It is recommended that SAHRA endorse the report as having satisfied the requirements of Section 38 (8) of the NHRA requirements.<br>• It is recommended that SAHRA make a decision in terms of Section 38 (4) of the NHRA to approve the proposed PRA on condition that the identified burial site is treated as no go area during prospecting and 100m buffer zone must be provided for in terms of SAHRA Regulations of 2020.<br>• The identified burial site must be properly mapped and marked on the prospecting plan.<br>• From a heritage perspective supported by the findings of this study, the PRA is supported. However, the prospecting should be approved under observation that prospecting does not extend beyond the area considered in this report/affect the identified heritage sites.<br>• Should chance archaeological materials or human remains be exposed during prospecting on any section of the site, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in Prospecting scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the NHRA regulations. | All recommendations have been included in the EIA Report | Section 13<br>Section 22<br>Section 24<br>Section 33<br>Section 35<br>Section 36<br>Section 38 |

| LIST OF STUDIES UNDERTAKEN | RECOMMENDATIONS OF SPECIALIST REPORTS | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED. |
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| | • Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMPr, there are no significant cultural heritage resources barriers to the proposed PRA. The Heritage authority may approve the PRA as planned with special commendations to implement the recommendations here in made. | | |
| Palaeontology | • There is no objection to the development, it may be necessary to request a Phase 1: Palaeontological Impact Assessment: Field Study if fossils are found during clearing or drilling. The palaeontological sensitivity is high and low, but fossils (stromatolites, recent) may be present.<br>• This project may benefit the economy, the growth of the community and social development in general.<br>• Preferred choice: Only one locality Option is presented and possible.<br>• Care must be taken during the grading of roads, digging of foundations, and removing topsoil, subsoil and overburden or blasting of bedrock. The following should be conserved: if any palaeontological material is exposed during digging, excavating, or drilling SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures.<br>• No consultation with parties was necessary (1o,p,q).<br>• This report must be submitted to SAHRA together with the HIA. | All recommendations have been included in the EIA Report | Section 13<br>Section 22<br>Section 24<br>Section 35<br>Section 36<br>Section 38 |
| Hydrology and Surface Water | Stormwater management plan was developed which indicated dirty and clean runoff areas. It is therefore recommended that dirty and clean water should not be mixed, and the areas | All recommendations have been included in the EIA Report | Section 13<br>Section 22<br>Section 24 |

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| | should be clearly marked. Ensure that topsoil is properly stored, away from the streams and drainage areas;<br>No construction activities will be undertaken within 100 metres of the nearby steams and 500 meters from riparian areas without consent from the DWS and vehicle and personnel movement within watercourses and riparian areas shall be strictly prohibited. | | Section 35<br>Section 36<br>Section 38 |
| Wetlands | The following recommendations must be taken note:<br>• Adequate stormwater management must be incorporated into the design of the project in order to prevent erosion and the associated sedimentation of the aquatic system;<br>• No construction activities shall be allowed within 500 m of riparian zones without consent from the Department of Water and Sanitation;<br>• No vehicles may be allowed to indiscriminately drive through the riparian areas or within the active stream channels;<br>• All disturbed areas shall be re-vegetated with indigenous species and all construction materials shall be kept out of the riparian areas; and<br>• All vehicles shall be regularly inspected for leaks. Re-fuelling must take place outside the project area, on a sealed surface area to prevent ingress of hydrocarbons into topsoil and aquatic ecosystems. | All recommendations have been included in the EIA Report | Section 13<br>Section 22<br>Section 24<br>Section 33<br>Section 35<br>Section 36<br>Section 38 |
| Noise | All of the receptor points were above the rural thresholds as observed on the noise depiction maps, for (Day and Night-time monitoring).<br>The following recommendations should, therefore, be explored;<br>• Monitoring should be done every quarter to determine the impact of the project operations on receptor areas during different seasons (for at least a year after operations begin | All recommendations have been included in the EIA Report | Section 13<br>Section 22<br>Section 24<br>Section 35<br>Section 36<br>Section 38 |

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| | and during construction). This is to determine the impact the project may have on surrounding environments. The baseline results will be used to compare for cumulative noise analysis. Noise differs from season to season; therefore, a better understanding of the noise profile may take time to attain.<br>• Noise barriers are and will be naturally established on the site (difference in elevations, hills, valleys and even waste rock dumps), and these normally slow down noise emanating from operations, alternatively, source controls can be explored, such as silencers on engine powered equipment and enclosures around generators and other noise intensive machines, for the protection of the employees on and around the site.<br>• Specific focus on the ecosystems found on and adjacent to the site should be ensured and noted. The prospecting needs to implement best practices to reduce and monitor noise impacts on sensitive receptors.<br>• Adjacent landowners must be advised of any work that will take place outside of normal working hours, that may be disruptive (e.gw. noise) in advance;<br>• Surrounding communities must be notified in advance of noisy construction activities;<br>• All equipment should be provided with standard mufflers. Muffling units on vehicles and equipment must be kept in good working order.<br>• Construction staff working in areas where the 8-hour ambient noise levels exceed 85 Dba should wear ear protection equipment;<br>• Where possible, operation of several equipment and machinery simultaneously must be avoided; | | |

| LIST OF STUDIES UNDERTAKEN | RECOMMENDATIONS OF SPECIALIST REPORTS | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED. |
|---|---|---|---|
| | • All equipment must be kept in good working order, with immediate attention being paid to defective silencers, slipping fanbelts, worn bearings and other sources of noise;<br>• Equipment must be operated within specifications and capacity (e.g. no overloading of machines);<br>• Regular maintenance of equipment must be undertaken, particularly with regard to lubrication;<br>• Equipment must be switched off when not in operation;<br>• Appropriate directional and intensity settings must be maintained on all hooters and sirens;<br>• The Contractor must ensure that the employees conduct themselves in an appropriate manner while on site; and<br>• Noise/vibration producing activities shall be limited to daylight hours (Monday to Friday 07H00 to 17H30 and Saturday 07H00 -14H00).<br>• No noise/vibration producing activities shall be undertaken on Saturdays on farms unless this has been agreed to by the farmer. | | |
| Visual | Visual impacts associated with the Temla 13 prospecting right Project are avoidable because of the isolation of the proposed site and does not hold severe impacts that would restrict the development from taking place.<br>The following issues be taken into consideration;<br>• Dust suppression will be undertaken to manage nuisance dust from construction vehicle movements and other construction activities as and when necessary;<br>• The portable ablution facilities and any other infrastructure will be acquired with a consideration for colour. Natural | All recommendations have been included in the EIA Report | Section 13<br>Section 22<br>Section 24<br>Section 35<br>Section 36<br>Section 38 |

| LIST OF STUDIES UNDERTAKEN | RECOMMENDATIONS OF SPECIALIST REPORTS | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED. |
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| | earth, green and mat black options which blend with the surrounding must be favoured;<br>• A waste management system will be implemented, and sufficient waste bins will be provided for onsite. A fine system must be implements to further prohibit littering and poor housekeeping practices; and<br>• Vegetation cover shall be used where drill rigs will be located to minimise visual impacts.<br>• The number of construction vehicles and machinery to be used shall be kept to a minimum.<br>• Movement of vehicles shall be kept to outside busy hours to minimise the visual impacts on the residents;<br>• Materials transported on public roads must be covered; and<br>• Where possible, rehabilitation of the work areas shall be undertaken in tandem with construction to ensure that areas stripped of vegetation are kept to a minimum. | | |
| Biodiversity | According to the South African National Biodiversity Institute (SANBI) the proposed site is classified as an CBAs 1 and 2 (Critical Biodiversity Areas are areas required to meet biodiversity targets for ecosystems, species and ecological processes, as identified in a systematic biodiversity plan) and the remaining areas as ONA, this implies that the proposed site plays a role in meeting biodiversity targets for ecosystems, species and ecological processes as identified in a systematic biodiversity plan. The sites were found to incorporate endemic trees species that will need to be considered during the planning and construction phase of the proposed activities. They also provide ecosystem services for both fauna and flora onsite. Specific conclusions and recommendations are listed below: | All recommendations have been included in the EIA Report | Section 13<br>Section 22<br>Section 24<br>Section 35<br>Section 36<br>Section 38 |

| LIST OF STUDIES UNDERTAKEN | RECOMMENDATIONS OF SPECIALIST REPORTS | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED. |
|---|---|---|---|
| | • The project area should be surveyed for species suitable for search and rescue, which should be translocated prior to the commencement of construction activities.<br>• All plants that have been identified to be removed are to be marked and verified with an Ecologist/Environmental Control Officer (ECO) and carefully removed.<br>• Necessary permits and licenses to cut, disturb, damage, destroy, remove, or rescue and translocate protected plants recorded within the project area must be applied for prior to any actions being taken.<br>• Commencement of prospecting activities must be preceded by a plant rescue Programme which must be conducted only when plant permits, and licenses have been issued by the relevant authority.<br>• No material storage or laydown is permitted under trees.<br>• No heavy equipment, machinery or vehicles may be parked under any tree unless authorized by the ECO.<br>• Prospecting right activities must be carried out according to the generally accepted environmental best practice and the temporal and spatial footprint of mining activities must be kept to a minimum.<br>• Existing roads must be used for access.<br>• The boundaries of the project footprint, including stockpiling areas, are to be demarcated and it must be ensured that all activities remain within the demarcated footprint area.<br>• Erosion and the proliferation of alien plant species will affect faunal habitats adjacent to the project area, these need to be strictly managed. This can be achieved through the clearing of alien invasive vegetation within the mining footprint. | | |

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|---|---|---|---|
| | • Any natural areas beyond the mining footprint, which have been affected by the prospecting activity, must be rehabilitated using indigenous plant species.<br>• Education and awareness campaigns on faunal species and their habitat are recommended to help increase awareness, respect, and responsibility towards the environment for all staff and contractors.<br>**Additional Measures**<br>In order to ensure that impact mitigation takes place to an adequate level should prospecting proceed it is deemed essential that a Biodiversity Action Plan (BAP) be developed which contains details on all actions that need to be undertaken to manage impacts on the ecology of the region. In addition, the BAP and its implementation should be overseen by an environmental panel which should include representatives from Temla 13 and any relevant local stakeholders like farmers. The BAP should also be seen as a living document and must be continuously updated based on the findings of management and the ecological monitoring program. The actions required from the BAP should be implemented into a fully automated Environmental Management System (EMS).<br>• The Contractor shall be on the lookout for SCC and any floral SCC encountered within the development footprint are to be relocated to areas with suitable habitat, outside the disturbance footprint;<br>• Floral species of conservation concern, if encountered within the development footprint, are to be handled with care and the relocation of sensitive plant species to suitable similar habitat is to be overseen by a botanist. The proposed development footprint shall be kept to the minimum; | | |

| LIST OF STUDIES UNDERTAKEN | RECOMMENDATIONS OF SPECIALIST REPORTS | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED. |
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| | • All disturbed areas must be concurrently rehabilitated during construction;<br>• Prohibit the collection of any plant material for firewood or medicinal purposes;<br>• The existing integrity of flora surrounding the study area shall be upheld and no activities shall be carried out outside the footprint of the construction areas;<br>• Edge effect control shall be implemented to avoid further habitat degradation outside of the proposed footprint area;<br>• All sensitive open space areas will be demarcated and access into these areas shall be prohibited;<br>• Protected floral species occurring within the vicinity of the study area, but outside the disturbance footprint shall be fenced for the duration of the construction activities;<br>• Monitoring of relocation success will be conducted during the operational phase;<br>• Construction related activities shall be kept strictly within the development footprint;<br>• Construction vehicles shall only be allowed on designated roadways to limit the ecological footprint of the project.<br>• Alien Invasive Plant Species Management plan to be implemented;<br>• Edge effects of activities including erosion and alien/ weed control will be strictly managed in the riparian area;<br>• All sites disturbed by construction activities shall be monitored for colonisation by exotic or invasive plants;<br>• Exotic or invasive plants shall be controlled as they emerge;<br>• An alien vegetation control program must be developed and implemented within all disturbed areas. After removal | | |

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|---|---|---|---|
| | of alien vegetation, the affected areas must be re-assessed to determine the success of the program and any follow up measures that may be required;<br>• The eradicated plant material must be disposed of at an approved solid waste disposal site;<br>• During post-construction, an alien vegetation removal and monitoring plan must be compiled for those areas which were not effectively rehabilitated;<br>• The extent of invasion must be established through investigation to identify priority areas;<br>• Priority species shall be identified to control and develop protocols for the removal of all alien species e.g. mechanical removal, herbicidal treatment etc. Mechanical, methods must be favoured for the removal of alien invasive species. Chemical removal shall only be undertaken by a suitably qualified and approved person; and<br>• As much vegetation growth as possible must be promoted in order to protect soils. In this regard, special mention is made of the need to use indigenous vegetation species where hydro seeding, rehabilitation planting (where applicable) is to be implemented.<br>• The proposed development footprint areas shall remain as small as possible and where possible be confined to already disturbed areas and no trapping or hunting of fauna shall be permitted;<br>• Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which may affect faunal habitat, need to be strictly managed;<br>• Should any SCC be encountered within the study area, these species will be relocated to similar habitat within or in the vicinity of the study area with the assistance of a suitably qualified specialist; | | |

| LIST OF STUDIES UNDERTAKEN | RECOMMENDATIONS OF SPECIALIST REPORTS | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED. |
|---|---|---|---|
| | • No informal fires in the vicinity of construction areas shall be permitted;<br>• An alien vegetation control plan must be developed and implemented in order to manage alien plant species occurring within the study area, and to prevent further faunal habitat loss. | | |

*Attach copies of Specialist Reports as Appendix 9*

# 19 Environmental Impact Statement

## 19.1 Summary of key findings

The impacts evident from the detailed impact assessment (Section 13) of the proposed project are both positive and negative in nature. The key positive and negative findings outlined below.

### 19.1.1 Key Positive Impacts After Mitigation

The main positive impacts identified for the project relate to socio-economic impacts that the construction and operation of proposed prospecting project will have. The proposed project will result in the prospering activities being undertaken for 5 years. These impacts were determined to have a positive impact, either directly or through the spinoffs generated by the development and operation of the proposed project and associated infrastructure.

In terms of local economy, there is the potential for multiple significant benefits to both local and regional businesses, as well as local employment opportunities. This would be highest, but temporary, during the construction phase, due to the requirement of contractors for services and materials. This has opportunities for both the formal and informal sectors, as smaller enterprises, including spaza shops, are likely to be established during the construction period to supply contractors and others with food and other amenities.

It is expected that Temla 13 will implement a policy allowing for preferential procurement for the local businesses and training of local Small, Medium, and Micro-sized Enterprises (SMME) on procurement and business management.

The project is expected to have a positive socio-economic benefit through short term employment of locals. Recruitment of labour will be guided by Temla 13's recruitment policies which are expected to promote the employment of local labour by Temla 13 as well as by any appointed contractors. Temla 13 will ensure that a transparent process of employment will be followed to limit opportunities for conflict that may arise.

The information that will be obtained from the prospecting to be done will be necessary to determine, should minerals be found, how and where the different minerals will be extracted and how much economically viable reserves are available within the proposed prospecting area. This will allow Temla 13 to enter into further studies towards a Mining Right.

Should minerals be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued. Temla 13 expects that substantial benefits from the project (should minerals be found) will accrue to the immediate project area, the sub-region, and the province. This prospecting activity has a potential to decrease level of unemployment rate in proposed areas and surroundings. This prospecting activity will bring revenue into the city and the province which will in turn boost the economy of the country.

### 19.1.2 Key Negative Impacts After Mitigation

During the proposed prospecting operation impacts may occur on soils, natural vegetation, surface water, groundwater, sensitive landscapes, air quality, noise, visual aspects, and sites of archaeological and cultural importance should the EMPr not be adhered to.

Temla 13 will undertake measures to ensure that the identified impacts are minimised. Assessment of the impacts with the proposed mitigation measures has shown the significance

of the impacts on all affected environmental aspects to be reduced from medium and low to low and negligible significance.

Land use will not materially change. Landowners and land occupiers within the proposed project area may be affected although on a temporary basis due to the need to access the sites and the establishment and use of the campsite. Measures such as safety along the roads and dust suppression will be undertaken to ensure that the impacts on the landowners and land occupiers are minimised.

Storm water runoff from the dirty water areas of the drilling sites, its associated surface infrastructure (campsite) may have a detrimental impact on the surrounding environment, wetlands, and water resources, particularly the wetlands located on the property should this water be released to the environment. In order to prevent the occurrence of the above-mentioned impacts, a stormwater management plan will be compiled based on the conceptual stormwater management plan included in Section 10 and implemented. Sediments will be created from the site during the construction, operational and decommissioning phase, which may impact negatively on the surrounding environment. The sediments will be treated should they contain hydrocarbon waste.

The employees will undergo training and will be given strict instruction not to undertake activities that will affect the environment and that may have an impact on the landowners. Waste generated from the site will be collected in proper receptacles and disposed of at registered waste disposal sites.

Key findings of the EIA include:

- All the identified impacts will be localised, short term and will have a medium and low significance. The significance of potential environmental impacts can be reduced to medium-low and low significance with implementation of mitigation measures and monitoring.
- Socio – Economic: Transportation of material to and from the study area will result in additional trucks and construction vehicles on the study area roads, which can cause damage to the road surface and increase the potential for accidents in the area. The influx of additional people looking for employment will result in impacts on the social dynamics in the area.
- Groundwater Impacts: Local spillages of hydrocarbons and chemicals used during the pre-construction and construction phase which may leach to groundwater. There is potential for leakages, spillages, and seepage of groundwater contaminants from infrastructure including the slimes dams and waste rock dump area.
- Surface Water: There are a number of watercourses that traverse the project area. Movement and use of vehicles and machinery as well as improper storage of hazardous substance may have Impacts on surface water and groundwater quality due to accidental spillages of hazardous substances. Contaminated dirty water runoff from the prospecting area to surrounding areas resulting in the impact on local surface water quality. A stormwater management plan will be compiled and implemented to ensure that water resources are protected. The removal or containment of dirty water will result in the removal of MAR from the catchment, as this runoff will now be considered dirty water and will need to be contained.

- The main cause of impacts to archaeological sites is direct, physical disturbance of the archaeological remains themselves and their contexts. The primary impacts are likely to occur during clearance and drilling, indirect impacts may occur during movement of heavy prospecting vehicles. Similarly, the clearing of access roads and campsites will impact material that lies buried in the topsoil. It is important to note that due to the localised nature of archaeological resources, that individual archaeological sites could be missed during the survey, although the probability of this is very low within the proposed prospecting site. Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during surface clearance. The purpose of the AIA is to assess the sensitivity of the area in terms of archaeology and to avoid or reduce the potential impacts of prospecting by means of mitigation measures (see appended Chance Find Procedure). There is still a possibility of finding archaeological remains buried beneath the ground.
- The heritage study identified a burial sites located on the project site. The implementation of the 100m buffer will ensure that gravesite is protected.
- Palaeontology Impacts: Sealing-in or destruction of the fossils during earth moving activities. Implementation of the mitigation measures in the specialist studies report and Section 13 of this report will reduce the potential for loss of fossils.
- There are a number of wetlands located on the property. The ecological significance of the watercourses should be viewed in the context of the overall level of functionality of the wetland. The study site is located within an area that is regarded as sensitive from a wetland point of view, and thus extra caution is required at every phase of the project. It is important to note that Wetlands are also protected under the National Water Act, and the Act makes no distinction between degraded and non-degraded wetlands in terms of their importance. As a result, the relevant legal requirements should be adhered to, and the relevant stakeholders involved in the project. All invasive alien vegetation on the property must be removed and eradicated. A buffer area of 32m around all the identified wetlands shall be demarcated as no-go zone where no infrastructure, access and project activities may be permitted. Temla 13 will also ensure proper management and implementation of mitigation measures to avoid edge effects of activities on the wetlands.
- Air Quality Impacts: The movement of vehicles in the area will have an impact on ambient air quality as follows:
    - Possible increase in dust generation, $PM_{10}$ and $PM_{2.5}$ as a result of bulk earthworks, operation of heavy machinery, and material movement.
    - Increase in carbon emissions and ambient air pollutants ($NO_2$ and $SO_2$) as a result of movement of vehicles and operation of machinery/equipment.
- Visual Impacts due to:
    - Visual intrusion as a result of the movement of machinery, presence of drill rigs, and the erection of contractor camps;
    - Scaring of the landscape as a result of the clearance of vegetation and preparation of the prospecting areas; and
    - Indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site area.

- Noise Impacts: The use of vehicles and machinery during the construction phase may generate noise in the immediate vicinity. Prospecting activities will result in an increase in ambient noise levels as a result of the prospecting activities.
- Cumulative noise, visual and air quality (dust) impacts are deemed to not be significant (low) when proper mitigation measures are implemented.
- Vegetation loss is unavoidable during the construction phase of the project. This will however be limited to the footprint of the infrastructure (access roads, camp, boreholes). Care must be taken to manage any species of special concern as well as the proliferation of alien invasive plant species.

The residual risk associated with the proposed project will largely relate to water management and rehabilitation following the operational phase. According to the hydrology specialist study, should the identified mitigation measures be implemented, the anticipated decrease in water quality attributable to increased pollutant load could be greatly reduced. Accordingly, the impact significance on drainage lines and wetlands downstream could be classified as minor during the construction and operation phases of the project, and negligible significance during the decommissioning phase. These monitoring requirements have been addressed in the EMPr.

The main impacts that will result from the closure phase will relate to the ineffectiveness of the construction and operational phases to eradicate alien vegetation, which will ultimately result in the loss of indigenous fauna and flora. In addition, the decommissioning activities may further impact on the established vegetation in the area, resulting in the loss of biodiversity species, habitats, and ecological structure. All the impacts that may result from the decommissioning activities of the proposed project have been effectively addressed in the impact assessment in Section 13.3, as well as the EMPr.

## 19.2 Final Site Map

The heritage resources and wetlands specialists have recommended buffer areas within which no project activities may be allowed so as to minimise and/or avoid impacts and edge effects on the burial site and wetlands in the area.

The applicant will ensure that the final layout of the project excludes activities in the no-go areas.

The site map is provided in Figure 19-1.

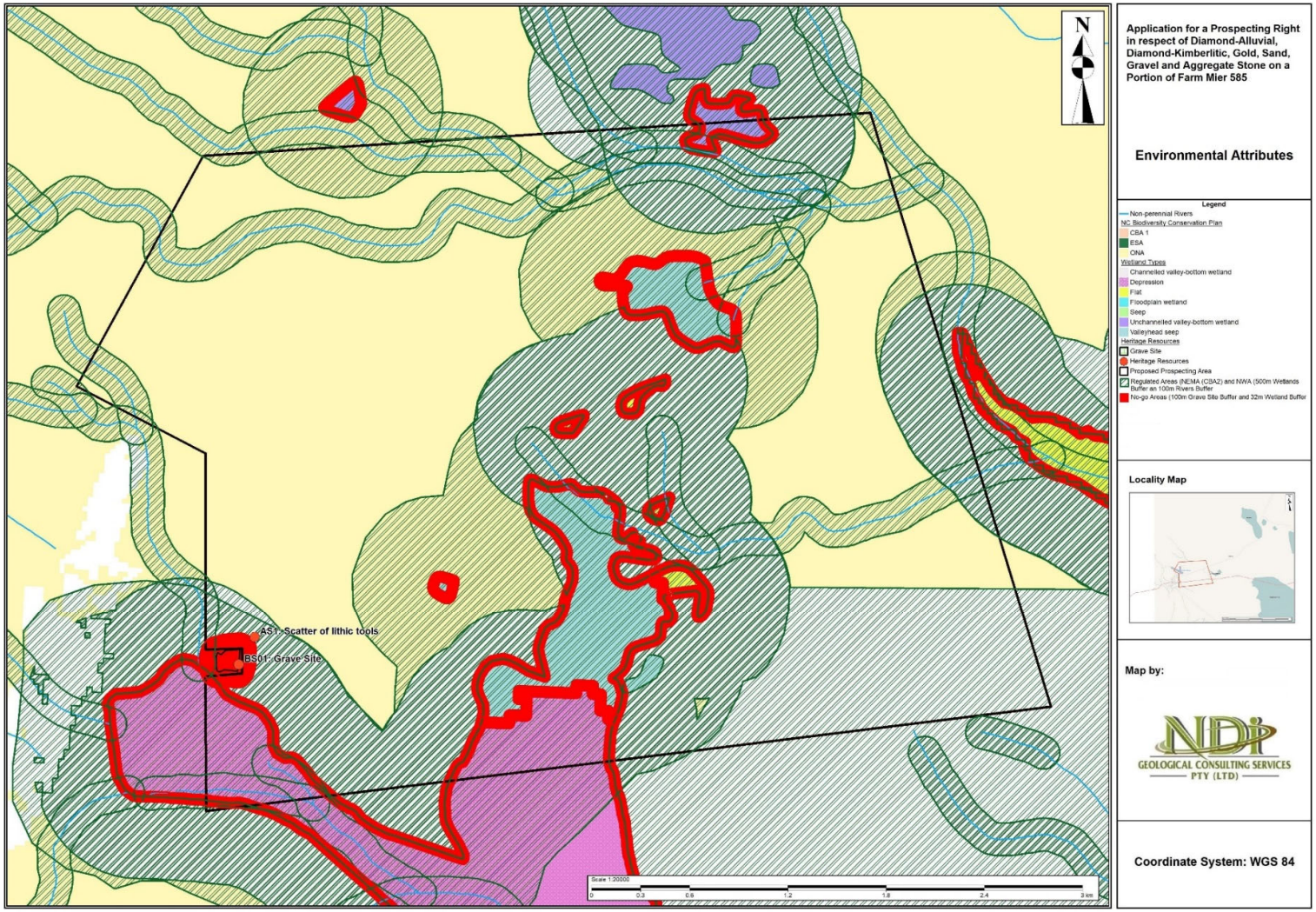


**Figure 19-1: Layout Plan**

## 19.3 Summary of the positive and negative implications and risks of the proposed activity and alternatives

The positive and negative implications were assessed according to the construction, operational and decommissioning phases of the proposed project. A detailed description of the main impacts is provided in Section 13 and the main impacts are provided in Section 19.1. A short summary is provided below for each phase of the project.

### 19.3.1 Construction Phase

During the construction phase of the proposed project the majority of the negative impacts are associated with site clearance and vegetation removal activities. Topsoil loss should be limited by storing and protecting the topsoil to be used for rehabilitation purposes.

Vegetation clearance during construction will also result in loss of natural vegetation and disturbance to fauna on site. Site clearance and vegetation removal will also result in a loss in land capability. Natural vegetation removal is expected to have moderate significance impacts. The biodiversity assessment shows that there are no protected biodiversity species (flora and fauna) that require special protection. It is however expected that there will be loss of flora and fauna species due to various project activities. The implementation of mitigation measures contained in Section 13 result in avoidance and/or minimisation of biodiversity impacts. Alteration of the sub catchment and increased sedimentation of surface water resources which may also impact aquatic biota may also occur due to the proposed prospecting project. The implementation of mitigation measures such as commencing rehabilitation activities in tandem with or immediately following construction will however reduce the duration and significance of the impacts. There are a number of wetlands located on the project site. The institution of the 32m buffer (no-go zone) as stipulated by the specialist as well as implementation of mitigation measures to manage potential edge effects will result in the protection of wetlands on the site. The HIA found that there is a burial site located on the project property that may be affected by the proposed project. It is however expected that the implementation of mitigation measured including demarcating the burial site and associated 100m buffer as no-go zones will result in the protection of the burial site. The main negative implications associated with other general construction activities are nuisance noise, traffic, dust, and visual impacts.

From a socio-economic perspective the development of the project will have a positive impact on employment creation, albeit temporary during the construction phase, economic and social upliftment, and community development. An increase in employment opportunities, household income and skills development will contribute to a positive growth in the local and regional economy.

### 19.3.2 Operational Phase

Drilling ground vibrations may result in possible damage to infrastructure and private property. With the implementation of mitigation measures, these impacts can be reduced to be of minor negative significance.

Furthermore, the operation of surface infrastructure and drilling process may lead to deterioration of water quality (surface and groundwater). Local spillages of hydrocarbons and chemicals used during the pre-construction and construction phase which may leach to groundwater. There is potential for leakages, spillages, and seepage of groundwater contaminants from infrastructure including the slimes dams and waste rock dump area.

There are a number of watercourses that traverse the project area. Movement and use of vehicles and machinery as well as improper storage of hazardous substance may have Impacts on surface water and groundwater quality due to accidental spillages of hazardous substances. Contaminated dirty water runoff from the prospecting area to surrounding areas resulting in the impact on local surface water quality. A stormwater management plan will be compiled and implemented to ensure that water resources are protected. The removal or containment of dirty water will result in the removal of MAR from the catchment, as this runoff will now be considered dirty water and will need to be contained.

Topsoil loss has been identified as a potential impact during the operational phase as a result of rainwater runoff and wind erosion from roads and soil stockpiles. In addition, alien vegetation may establish on the topsoil. This can be prevented by planting indigenous grass mixture, which will also assist in erosion reduction.

Ineffective rehabilitation of construction areas will lead to proliferation of alien invasive plant species. Similar to the construction phase, nuisance noise, dust and visual impacts are expected from general operation activities. All of these impacts can be mitigated.

Prospecting will be undertaken by special sub-contractors, and it is not anticipated that employment opportunities for local and/or regional communities will result from operational phase of the project. The prospecting will also determine if there are any features that may have an impact on the economic extraction of the Diamond (Alluvial and Kimberlitic), Sand and Trace Gold ore.

The information that will be obtained from the prospecting to be undertaken will be necessary to determine, should minerals be found, how and where the minerals will be extracted and how much economically viable reserves are available within the proposed prospecting area. Should good quality minerals be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued.

### 19.3.3 Decommissioning Phase

During the decommissioning phase positive impacts will occur from rehabilitation activities including the restoration of land capability to its pre-prospecting state or agreed upon alternative, the restoration of vegetation and habitat types as well as the rehabilitation of infrastructure footprint areas. Alternatively, should good quality minerals be found in the project area, Temla 13 will be able to mine the available reserves.

The main impacts that will result from the closure phase will relate to the ineffectiveness of the construction and operational phases to eradicate alien vegetation, which will ultimately result in the loss of indigenous fauna and flora. In addition, the decommissioning activities may further impact on the established vegetation in the area, resulting in the loss of biodiversity species, habitats, and ecological structure. The other expected negative impacts are associated with the movement of machinery to dismantle and remove equipment and infrastructure and rehabilitate the disturbed areas. Negative impacts resulting from soil loss, erosion and dust emissions were also identified.

The residual risk associated with the proposed project relates to water management and rehabilitation following the operational phase.

Post closure monitoring is essential to determine if rehabilitation was successful and sustainable.

# 20 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

The EMPr seeks to achieve a required end state and describes how activities that have, or could have, an adverse impact on the environment and surrounding communities will be mitigated, controlled, and monitored.

The EMPr compiled for the proposed project addresses the environmental impacts and possible unplanned events during each phase of the project (construction and operation and rehabilitation). Due regard was given to environmental protection during the entire project and a number of environmental recommendations were made to achieve environmental protection.

The objectives of impact mitigation and management are to:

- Primarily pre-empt impacts, assess their significance and implement appropriate mitigation and management measures to avoid, minimise and/or remediate the associated impacts where they cannot completely be avoided.
- Implement an adequate monitoring programme to:
    - Ensure that mitigation and management measures are effective.
    - Allow quick detection of potential impacts, which in turn will allow for quick responses to issues/impacts.
    - Reduce duration of any potential negative impacts.

The objectives of the EMPr are to:

- Provide sufficient information to strategically plan the project activities as to avoid unnecessary social and environmental impacts;
- Provide sufficient information and guidance to plan the project activities in a manner that will reduce impacts (social, physical, and biological) as far as is practically possible;
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance; and
- Provide a management plan that is effective and practical for implementation.

Through the implementation of the identified proposed mitigation measures, it is anticipated that the identified impacts can be managed and mitigated effectively. Table 20-1 provides a summary of impact management objective and outcomes for the project.

**Table 20-1: Impact Management Objectives and Management Outcomes**

| Objectives | Outcomes |
|---|---|
| **Soil** | |
| Ensure suitable removal, storage, transportation of topsoil for reuse during rehabilitation.<br>To manage soil erosion. | No visual evidence of erosion.<br>No visual evidence of erosion from topsoil stockpiles and from areas where topsoil has been reinstated. |
| **Flora** | |

| Objectives | Outcomes |
|---|---|
| Minimise unnecessary clearance of indigenous vegetation.<br>Preserve protected flora species.<br>Control alien plants and noxious weeds. | Clearance of vegetation to be limited to the requires footprints.<br>No disturbance to SCC without permits.<br>No net-loss of biodiversity.<br>Ongoing eradication of alien invasive plants and noxious weeds. |
| **Fauna** | |
| Ensure the protection of animals. | No direct / indirect harm to animals from construction activities. |
| **Wetlands** | |
| Minimise impact to wetland areas.<br>Minimise environmental impacts associated with stormwater.<br>Minimise stormwater runoff from the site. | Reduced impact to wetland areas.<br>Rehabilitation of wetland areas.<br>Protection of wetlands on the project site<br>No visual evidence of erosion caused by wastewater or stormwater practices.<br>No environmental contamination associated with effluent management or stormwater practices. |
| **Noise** | |
| Minimise noise nuisance. | No complaints regarding noise pollution.<br>Comply with SANS 10103:2008 and OHS requirements. |
| **Air Quality** | |
| Minimise dust generation<br>Minimise air pollution | No complaints regarding nuisance dust<br>No exceedances of nuisance dust emissions at identified receptors |
| **Groundwater and Surface Water Resources** | |
| Minimise ground and surface water quality impacts<br>Minimise groundwater drawdown<br>Minimise reduction in groundwater flowing to surrounding users | No pollution of groundwater resources<br>No/minimal lowering of groundwater levels due to over abstraction of groundwater |
| **Visual** | |
| Minimise impacts to the aesthetics / visual quality.<br>Ensure that the visual appearance of the site is not an eyesore the adjacent areas. | No complaints regarding impacts to visual quality. |
| **Safety and Security** | |
| Provide a safe and healthy working environment to construction workers and the public. | No complaints regarding impacts to safety and security.<br>No reportable health and safety incidents.<br>Compliance with the OHS Act, Construction Regulations (2014) and other relevant regulations. |
| **Traffic** | |
| Ensure the safety of all road users by implementing proper signage and traffic control measures.<br>Minimise traffic disruptions. | No reports of construction vehicles using other unauthorised routes.<br>No transporting of unsafe loads. Permits are to be obtained for abnormal loads.<br>No speeding. |

| Objectives | Outcomes |
|---|---|
| | No accidents. |
| **Heritage** | |
| To avoid damage to or destruction of previously unknown or excavated heritage resources and archaeological artefacts during construction.<br>The preservation and appropriate management of new findings should these be discovered during construction. | No archaeological and cultural resources or graves to be damaged during construction. |
| **Waste** | |
| Minimise environmental impacts associated with waste. | Comply with the requirements of the NEM: WA and implement the waste management hierarchy<br>No littering on site.<br>Maintain a clean and tidy site.<br>100% record of all waste generated and disposed at waste disposal facilities.<br>Valid disposal certificates for all waste disposed.<br>Provision of adequate waste containers that are easily accessible and maintained. |

# 21 Final Proposed alternatives

## 21.1 Preferred Option

Rooikoppie gravels will be prospected with shallow pits and trenches. Prospecting and sampling are planned over a 500 x 500 m grid for Phase 2. Every excavation will be documented to design a model of the gravel body. The prospecting/bulk sampling unit for alluvial will comprise 1 x 16' rotary wetlands with relevant earthmoving equipment (1 excavator, 1 front-end loader, 1 dump truck) and standard auxiliary equipment, e.g., generator, pumps, sorting house, campsite, etc. Modern Bourevestnik or similar type concentrator will be also tested. Accompanying alluvial gold will be extracted using shallow sluice boxes at the initial stages. If viable grades would be verified, more sophisticated concentrating equipment will be tested.

Building sand and gravel will be extracted utilising a size classifying module. The provisional layout of trenches/pits. This will be adjusted depending on the outcomes of the practical tests. In case of deviation from the preliminary plan over 10-15%, both in terms of spatial distribution and the ultimate depth of the pits, the amended program and EMP will be duly submitted to DMR for approval and endorsement.

The prospecting project will include:

- Prospecting and bulk sampling with pits and trenches;
- Ablution facility;
- Access roads;
- Diesel storage;
- Office site;
- Plant site;
- Slimes dam;
- Office Area; and
- Vehicle parking area.

The PR will be required for five (5) years.

## 21.2 Alternative Option

The location of the proposed project components is constrained to the location with potential for the mineral resources (Diamond (Alluvial and Kimberlitic), Sand, Gravel, Trace Gold reserves). The project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting. In addition few fragments of severely weathered kimberlite were collected during site visit within project area. This confirms kimberlite presence within target area. Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous. Gravels moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades.

As such, no property alternatives were viable to be considered for this project.

Since no complicated surface infrastructure will be required for this project no design and layout alternatives for the proposed project were determined. The heritage resources and wetlands specialists have recommended buffer areas within which no project activities may be allowed so as to minimise and/or avoid impacts and edge effects on the burial site and wetlands in the area. The no-go areas are shown in Figure 15-1.

The applicant will ensure that the final layout of the project excludes activities in the no-go area.

# 22 Aspects for inclusion as conditions of Authorisation

The construction of the plant must be conducted under duty of care and must be in accordance with the mitigation measures that were included in the EMPr to ensure that impacts are prevented and if they do occur, they are kept to the minimum. The management of the impacts identified for the construction, operation and closure phase is through a comprehensive range of programmes and plans contained in the EMPr. Implementation of these plans and programmes together with mitigation measures stipulated in the EMPr will be institutionalized through regular monitoring and auditing.

In order to achieve relative environmental management standards and ensure that the findings of the environmental assessment are implemented through practical measures, the recommendations and management measures from this EIA study are included within an EMPr.

The EMPr must be used to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for the life cycle phases of the project is considered to be vital in achieving the appropriate environmental management standards as detailed for this project.

The following key conditions should be included as part of the authorisation:

- No activities may be undertaken within 100 m of watercourses and 500m within wetlands without approval from the DWS;
- No removal and/or relocation of protected species may be undertaken without relevant permits.
- No graves and/or cultural and palaeontological resources may be relocated and/or destroyed without relevant permits from SAHRA.
- The proponent is not exempted from complying with any other statutory requirements that is applicable to the undertaking of the activity. Relevant key legislation that must be complied with by the proponent includes inter alia:
    - Provisions of the National Environmental Management Waste Act (No. 59 of 2008);
    - Provisions of the National Water Act, 1998 (Act No 36 of 1998);
    - Provisions of the National Forests Act (Act No 84 of 1998); and
    - Provisions of the National Heritage Resources Act, 1999 (Act No. 25 of 1999);
- The proponent must appoint a suitably experienced (independent) ECO for the construction phase of the development that will have the responsibility to ensure that the mitigation and rehabilitation measures and recommendations are implemented and to ensure compliance with the provisions of the EMPr;
- A Stormwater Management Plan must be compiled and must be adhered to;
- The EMPr must be enforced throughout the life of the project;
- Environmental audits reports must be submitted to the DMR on a monthly basis once construction has begun and on an annual basis during the operational phase. This is to ensure that mitigation measures are being implemented and to prevent

environmental degradation (e.g. erosion) during the construction and operational phases.

# 23 Assumptions and limitations

Ndi Geological has exercised all due care in reviewing the supplied information. Whilst Ndi Geological Consulting has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data.

Opinions presented in this report apply to the information about the site and the project as it existed at the time of Ndi Geological's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this report, about which Ndi Geological Consulting had no prior knowledge nor had the opportunity to evaluate.

All the data and information supplied to Ndi Geological is assumed to be accurate and reflective of the current condition of the affected area. It is assumed that the baseline information reviewed and used to explain the environmental profile is accurate.

The public involvement process has been sufficiently effective in identifying the critical issues needing to be addressed in the EIA / EMPr by the EAP. The public involvement process has sought to involve key stakeholders and individual landowners.

Wherever possible the information requested, and comments raised by I&APs during the initiation and scoping phases has been sufficiently addressed and incorporated into the EIA and EMPr that will be submitted to the DMR.

Ndi Geological assumes that Temla 13 will implement the measures contained in the EMPr and will adhere to any monitoring procedures. A monitoring and evaluation system, including auditing, will be established, and operationalized to track the implementation of the EMPr ensuring that management measures are effective to avoid, minimize and mitigate impacts and that corrective action is being undertaken to address shortcomings and / or non-conformances. It is expected that Temla 13 will comply with all legislation pertaining to the activities of this proposed project and that all permits and licenses that may be required will be identified and applied for prior to commencement of construction activities.

The following assumptions and limitation apply to the different specialist studies that were conducted for the proposed project

## 23.1 Biodiversity

The following assumptions and limitations are applicable to the floral assessment:

- To obtain a comprehensive understanding of the dynamics and diversity of the biota on a site, including species of conservation concern, studies should include investigations through the different seasons of the year, over several years, and extensive sampling of the area. This is particularly relevant where seasonal limitations to biodiversity assessments exist for the area of the proposed activity.
- Due to project time constraints inherent with EA application processes, such long-term research is seldom feasible, and information contained within this report is based on a single field survey conducted during a single season.
- The client was made aware of and accepted possible limitations due to the survey not being carried out during the peak growing season for vegetation (November to April). Accordingly, it is acknowledged that not all plant species present on site were fully

identifiable due to the timing of the survey. Where possible, additional information was added from available sources and previous studies conducted in the area.

- Further, the specialist field assessments were conducted based on boundaries provided by the client at the time of the field assessment and differs from the development boundary provided with the final layout plan made available to the specialists at a later stage. Potential impacts of the proposed activity were therefore evaluated based on the proposed layout of the associated activity as provided at the time of writing, field-based assessments conducted within the site development boundary provided at the time of the field-based assessment, and recommendations for the most appropriate mitigation measures provided accordingly. If the final layout of the proposed activity differs from that used within the present study, assessment of the associated impacts and the proposed mitigation thereof may require revision. Where proposed development areas were not assessed in detail as a result of different developmental boundaries at the time of the relevant process (e.g. field assessment), further assessments will be required to properly inform the assessment of potential impacts.
- This report is based on survey and assessment techniques which were limited by time and budgetary constraints relevant to the type and level of investigation undertaken yet exercising due care and diligence in rendering services and preparing documents.
- Findings, recommendations, and conclusions provided in this report are based on the authors' best scientific and professional knowledge as well as information available at the time of compilation. The authors, however, accept no liability for any actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with services rendered, and by the use of the information contained in this document. Any recommendations, statements, or conclusions drawn from or based on this report must cite or make reference to this report. Whenever such recommendations, statements or conclusions form part of the main report relating to the current investigation, this report must be included in its entirety.

## 23.2 Heritage Resources Assessment

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be remembered that archaeological deposits (including graves and traces of heritage resources) usually occur below the ground level. Should artefacts or skeletal material be exposed during prospecting activities, such activities should be halted immediately, and a competent heritage practitioner and SAHRA must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA (Act No. 25 of 1999), Section 36 (6). Recommendations contained in the HIA Report do not exempt the applicant from complying with any national, provincial, and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. Integrated Specialist Services (Pty) Ltd assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report.

## 23.3 Palaeontology Impact Assessment

The accuracy and reliability of the report may be limited by the following constraints:

- Most development areas have never been surveyed by a palaeontologist or geophysicist.
- Variable accuracy of geological maps and associated information.
- Poor locality information on sheet explanations for geological maps.
- Lack of published data.
- Lack of rocky outcrops.
- Inaccessibility of site.
- Insufficient data from developer and exact lay-out plan for all structures - sufficient.

## 23.4 Visual Impact Assessment

The limitations to conduct a sound visual impact of the proposed site are mainly contributed to the availability of data. Sufficient geographical data was provided to conduct a full visual impact assessment for the proposed scheme, however most of the information lacked descriptive data. The existing data was supplemented with land cover/ land use data captured specifically for this project from monochrome aerial photographs. Assumptions were made as far as the existing operations within the urban fabric and immediate site activities.

## 23.5 Wetlands Delineation and Assessment

The survey and assessment techniques were limited by time and budgetary constraints relevant to the type and level of investigation undertaken. The findings, results, observations, conclusions, and recommendations given in this report are based on the author's best scientific and professional knowledge as well as information available at the time of the study. Therefore, the author reserves the right to modify aspects of the report, including the recommendations, if and when new information may become available from ongoing research or further work in this field, or pertaining to the study.

## 23.6 Hydrology and Surface Water

The following are key assumptions and limitations for the conceptual SWMP:

- The SWMP and associated calculations are based on the current infrastructure layout. Should the infrastructure layout change, then the SWMP will need to be revised;
- The conceptual SWMP is based on low resolution 5 m contour interval data. This is sufficient for conceptual purposes for the Water Use Licence Application (WULA) and EIA/EMPr, however, more detailed elevation data will be required for the design phase of the project;
- The conceptual SWMP should only be used to provide an indication of the required clean and dirty water separation, as required for the WULA and EIA/EMPr. This conceptual SWMP should be used as a guide for the design phase of the project; and
- The channels were sized to take the maximum flow calculated at the downstream end of the contributing catchment, and it is assumed that the channel sizing will be uniform along the entire length.

# 24 Reasoned opinion as to whether the proposed activity should or should not be authorised

## 24.1 Reasons why the activity should be authorised or not

It is the considered opinion of the EAP that the activity may be authorised. The project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting. In addition few fragments of severely weathered kimberlite were collected during site visit within project area. This confirms kimberlite presence within target area. Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous. Gravels moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades. The site is therefore regarded as the preferred site and alternatives are not considered.

The option of not approving the activities will result in a significant loss of valuable information regarding the mineral status (in terms of the various minerals), present on the identified project area. In addition, should economical reserved be present and the applicant does not have the opportunity to prospect the opportunity to utilize these reserves for future phases will be lost.

The environmental impacts of prospecting are generally of low significance, short lived and can be mitigated to even lower levels of significance. Concurrent or progressive rehabilitation of disturbed areas is standard good practice and should be undertaken as it will reduce the project's environmental liability and costs at closure as rehabilitation is included in the operational activities of the project.

Various specialist studies were undertaken during the impact assessment phase of the proposed project with the objective of identifying and weighing anticipated impacts and risks associated with the project activities as well as in accordance with all relevant legislative requirements. No fatal flaws were identified by the specialists.

According to the impact assessment undertaken for the proposed project, the impacts of the project on the receiving environment are considered to be of medium and low significance, including:

- Potential loss of flora and fauna species;
- Loss and fragmentation of habitat of fauna species and direct loss of fauna which will be expected to move from the area as a result of increased anthropogenic activities;
- Groundwater and surface water contamination due to chemical contamination from hazardous substance and seepage from waste storage areas including the WRD and slimes dam; and
- Nuisance noise, dust, and visual impacts.

Where possible, mitigation and management measures, no-go areas, as well as further recommendations have been provided by specialists which will lead to a reduction in the significance of these impacts to medium-low to low significance, including:

- Stormwater management plan will be implemented throughout the life of the project

- The infrastructure will be designed so as to protect groundwater and surface water resources;
- The layout plan will be such that no sensitive environments will be impacted including wetlands (32m buffer imposed) and burial site (100m buffer imposed);
- Re-vegetation of the rehabilitated areas with indigenous species;
- Where possible rehabilitation will be conducted in tandem with construction and operational phases of the project;
- Develop and implement a biodiversity management plan; and
- The land use and the overall land capability as the soil can be rehabilitated to be reused for agricultural purposes.

The project will also have positive impacts due to the employment to be created although for a short term, as well as a short boost to local businesses.

The stakeholders will also be requested for their comments. All comments to be received during Public Participation Process will be included in this EIR and EMPr. These comments will be addressed the as far as possible to the satisfaction of the I&APs.

The management of the impacts identified in the impact assessment for all phases of the proposed project will be undertaken through a range of programmes and plans contained in the EMPr. In consideration of the layout plan and the management and mitigation measures contained within the EMPr compiled for the project, which are expected to be effectively implemented, there will be significant reduction in the significance of potential impacts.

Monitoring plans, which should be implemented throughout the life of the project, have also been provided to ensure that adverse impacts are reduced, and continuous improvements are made.

With the correct and effective mitigation and management measures, including the protection of sensitive environments outside the footprints of the project areas and infrastructure, the prospecting operations are deemed feasible and desirable. Rehabilitation must be implemented based on best practice principles and the DMR, DWS and DFFE should monitor activities during the construction, operational and closure phases of the proposed project.

## 24.2 Conditions that must be included in the authorisation

### 24.2.1 Specific conditions to be included into the compilation and approval of the EMPr

The following specific conditions are proposed:

- All mitigation measures in this report should be implemented;
- Temla 13 must ensure that the project complies with all applicable legislation.
- Storage of hydrocarbons and chemicals must be undertaken in a dedicated area and must include a bund or a drain where necessary to contain any spillages during the use, loading and off-loading of the substances.
- No dumping of waste shall be permitted. If any spills occur, they should be immediately cleaned up.

- All vehicles shall be inspected for leaks on a regular basis. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil.
- Informal fires by construction personnel within the study area shall be prohibited.
- The SWMP must be compiled and implemented, and infrastructure maintained in order to prevent pollution of water resources.
- No construction activities may be undertaken within the wetland areas and associated 32m buffer area which has been designated no-go areas.
- No construction within 500m of wetlands can be undertaken without a licence from the DWS.
- All flora and fauna SCC must be relocated by a qualified biodiversity specialist as part of a relocation and monitoring plan prior to commencement of construction activities. Where it is not possible to relocate SCC, required permits must be obtained prior to commencement of construction activities.
- No fauna may be poached during the construction or operational phase of the project.
- Records of Stakeholder engagements must always be kept through the use of a complaints register.
- The proposed development footprint shall be kept to a minimal.
- All hazardous storage containers, storage areas, and bunding areas for hazardous substances must comply with the relevant SANS standards to prevent leakage.
- The time in which soils are exposed during construction activities should remain as short as possible.
- It must be ensured that soil disturbance does not occur outside of the development footprint, as to ensure that further alien proliferation does not occur within the vicinity of the development footprint, which would further reduce the present ecological state of the surrounding area.
- Exotic or invasive plants shall be controlled as they emerge, as such, an alien vegetation control program must be developed and implemented within all disturbed areas.
- All areas of disturbed and compacted soils need to be ripped and reprofiled.
- No trapping or hunting of faunal species is to take place during all phases of the proposed project.
- Upon completion of construction activities, it must be ensured that indigenous vegetation is reintroduced and used for landscaping where possible.
- Regular inspection and maintenance of the infrastructure shall be undertaken during the operation phase to ensure the integrity is not compromised.
- Temla 13 will ensure that only waste indicated in the EIA for the project may be stored on site.
- Environmental auditing and reporting

  - Temla 13 must undertake monthly environmental audits to audit compliance with conditions related to this environmental authorisation and the approved EMPr and submit the report to the DMR.
  - Temla 13 must keep an incident report and complaints register, which must be made available to the external auditor and representatives of relevant departments (DMR and DWS) for the purpose of audit.
- Temla 13 will ensure that the DMR is be notified as soon as the following incidents occur:
  - Any malfunction, breakdown or failure of equipment or techniques, accident or fugitive emission which has caused , is causing or may cause significant pollution; and
  - Any significant adverse environmental and health effects.
- General operation and impact management of waste management activities:
  - No waste may be disposed on the site. All waste produce must be collected by a registered waste management contractor and waste manifests must be kept at the site and made available on request.
  - Temla 13 must prevent spillages, and where the spillages occur, they will be effectively and safely cleaned.
  - Temla 13 must prevent the occurrence of nuisance conditions or health hazards.

### 24.2.2 Rehabilitation requirements

The post-prospecting land use should be restored to agriculture purposes and should represent the pre-prospecting land use, as far as possible. The rehabilitation of the project will aim to:

- Ensure that the final elevation around the site is free draining.
- Ensure that soil is replaced in the same sequence to ensure soil characteristics are retained as far as possible.
- Ensure a self-sustaining post-prospecting land capability similar to pre-prospecting of agriculture.
- Ensure that the rehabilitated areas are cleared of all contaminating substances and that runoff from the area is returned to the natural catchment.
- Ensure that vegetation growth and cover on the rehabilitated areas is sustainable and local indigenous species are establishing on the site and that succession and colonisation from surrounding areas is taking place on rehabilitated areas. Ecological and ecosystem processes should function optimally after a prescribed period.
- Ensure that alien invasive species are eradicated until the closure certificate is granted.
- In order to ensure rehabilitation of the site can be undertaken responsibly, soils must be stripped and stockpiled separately. This will ensure preservation of soil for re-use in rehabilitation of the site.

The closure period is defined as the period between the cessation of prospecting activities, and the completion of active rehabilitation actions on the applicable site. It is important to note that

the nature of prospecting drilling is such that closure may be implemented for individual boreholes as and when the analysis ends.

The closure and rehabilitation objectives for the project are listed below, and should be met:

- Achieve a final land use that is sustainable and meets both legislative requirements and stakeholder needs;
- Maintain and monitor all rehabilitated areas following re-vegetation and, if this monitoring shows that the objectives have been met, make an application for closure;
- Comply with local, district and national regulatory requirements; and
- Follow a comprehensive consultation and communication process with all stakeholders.

The overall closure objectives for the proposed project are provided in Section 38.1.

Following successful completion of the active closure actions it is suggested that a further post closure period be assigned to allow for monitoring of the success of closure. It is anticipated that a period of two (2) to three (3) years be permitted for on-going post closure monitoring. This post closure monitoring will include the following:

- Inspection of borehole plug integrity;
- Monitoring surface and groundwater quality and levels;
- Inspection of any area with erosion;
- Ensuring that the trenches are fully rehabilitated and do not pose a threat to wildlife and humans;
- Vegetation cover and composition including alien invasive plant species

# 25 Period for which the Environmental Authorisation is required

The EA/WML will be required for a period of 5 years.

# 26 Undertaking

We hereby confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the EIR and the EMPr Report.

# 27 Financial Provision

The amount required to cover the rehabilitation is anticipated to be R 473743.00 at this stage. A guarantee paid to DMR for a financial guarantee as required by the Environmental Management Programme will be amended every financial year. The calculated financial provision is provided in Table 27-1.

## 27.1 Explain how the aforesaid amount was derived

The financial provision required to be submitted by the holder of a prospecting right, mining right or mining permit (in the terms of Regulation 53 of the MPRDA Act 28 of 2002) is to achieve the total quantum for rehabilitation and remediation of the environmental impacts and associated damage as well as close-out must be provided. Regulation 54 requires that the quantum of financial provision, to be approved by the minister, must be based on the requirements of the approved EMPr.

Regulation 53 and 54 of the Mineral and Petroleum Resources Development Regulations were replaced by the NEMA: Regulations pertaining to the financial provision for prospecting, exploration, mining, or production operations (in GN 1147 *GG* 39425 of 20 November 2015). According to Regulation 5 of the NEM: Financial Provisions Regulations (2015, as amended in 2018), the scope of a financial provision requires an applicant or holder of a right or permit to make financial provision for—

- Rehabilitation and remediation;
- Decommissioning and closure activities at the end of prospecting, exploration, mining, or production operations; and
- Remediation and management of latent or residual environmental impacts which may become known in future, including the pumping and treatment of polluted or extraneous water.

As per Regulation 6, an applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for─

- Annual rehabilitation, as reflected in an annual rehabilitation plan;
- Final rehabilitation, decommissioning and closure of the prospecting, exploration, mining, or production operations at the end of the life of operations, as reflected in a final rehabilitation, decommissioning and mine closure plan; and
- Remediation of latent or residual environmental impacts which may become known in the future, including the pumping and treatment of polluted or extraneous water, as reflected in an environmental risk assessment report.

The holder of a prospecting right, mining right or mining permit is required to annually assess the total quantum of environmental liability for a prospecting or mining operation and ensure that financial provisions are sufficient to cover the current liability (in the event of premature closure) as well as the end-of-mine liability. This is referred to as the "*window in time or snapshot in time approach*" as each assessment provides an indication of the environmental liability at that time only.

The best practice procedure for calculating financial closure liability that was followed is summarised as follows:

- Determine the risk class of the project.
- Determine the area sensitivity in which the project is located.
- Determine the level of information available for calculating the financial liability.
- Determine the closure components associated with the project
- Determine the unit rates for the associated closure components.
- Determine and apply various weighting factors (site specific).
- Identify the areas of disturbance.
- Identify any specialist studies required.
- Calculate the closure liability using the guideline template provided.

## 27.2 Confirm that this amount can be provided for from operating expenditure

Temla 13 will fund the operation and hereby confirms that the amount is anticipated to be an operating cost and is provided for as such in the PWP.

## Table 27-1: Cost Estimate Expenditure

| No. | Description | Unit | A<br>Quantity | B<br>Master Rate | C<br>Multiplication factor | D<br>Weighting factor 1 | E=A*B*C*D<br>Amount (Rands) |
|---|---|---|---|---|---|---|---|
| 1 | Dismantling of processing plant and related structures (including overland conveyors and powerlines) | m3 | 200 | **R 18.91** | 1 | 1 | 3782 |
| 2 (A) | Demolition of steel buildings and structures | m2 | 0 | **R 259.45** | 1 | 1 | 0 |
| 2(B) | Demolition of reinforced concrete buildings and structures | m2 | 0 | **R 377.62** | 1 | 1 | 0 |
| 3 | Rehabilitation of access roads | m2 | 2000 | **R 44.64** | 1 | 1 | 89280 |
| 4 (A) | Demolition and rehabilitation of electrified railway lines | m | 0 | **R 433.26** | 1 | 1 | 0 |
| 4 (A) | Demolition and rehabilitation of non-electrified railway lines | m | 0 | **R 236.33** | 1 | 1 | 0 |
| 5 | Demolition of housing and/or administration facilities | m2 | 0 | **R 498.91** | 1 | 1 | 0 |
| **6** | **Opencast rehabilitation including final voids and ramps** | **ha** | **0.3** | **R 253 918.43** | **0.52** | **1** | **39611.27508** |
| 7 | Sealing of shafts adits and inclines | m3 | 0 | **R 133.92** | 1 | 1 | 0 |
| 8 (A) | Rehabilitation of overburden and spoils | ha | 0.1 | **R 174 355.57** | 1 | 1 | 17435.557 |
| 8 (B) | Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential) | ha | 0.01 | **R 217 156.72** | 1 | 1 | 2171.5672 |
| 8 ( C ) | Rehabilitation of processing waste deposits and evaporation ponds (polluting potential) | ha | 0 | **R 630 726.04** | 1 | 1 | 0 |
| 9 | Rehabilitation of subsided areas | ha | 0 | **R 145 996.53** | 1 | 1 | 0 |
| 10 | General surface rehabilitation | ha | 1 | **R 138 119.02** | 1 | 1 | 138119.02 |
| 11 | River diversions | ha | 0 | **R 138 119.02** | 1 | 1 | 0 |
| 12 | Fencing | m | 0 | **R 157.55** | 1 | 1 | 0 |
| 13 | Water management | ha | 0.2 | **R 52 516.74** | 1 | 1 | 10503.348 |
| 14 | 2 to 3 years of maintenance and aftercare | ha | 2 | **R 18 380.86** | 1 | 1 | 36761.72 |
| 15 (A) | Specialist study | Sum | 0 | | | 1 | 0 |
| 15 (B) | Specialist study | Sum | | | | 1 | 0 |
| | | | | | Sub Total 1 | | 337664.4873 |

| | | | | |
|---|---|---|---|---|
| 1 | Preliminary and General (12.0% of Subtotal 2) | 40519.73847 | **weighting factor 2** | 40519.73847 |

| | | | | |
|---|---|---|---|---|
| | | | 1 | |
| 2 | Contingencies (10.0% of Subtotal 2) | 33766.44873 | | 33766.44873 |
| | | | Subtotal 2 | 411950.67 |
| | | | VAT (15%) | 61792.60 |
| | | | **Grand Total** | **473743** |

# 28 Deviations from the approved scoping report and plan of study

## 28.1 Deviations from the impact assessment methodology

There are no deviations from the impact assessment methodology that was submitted with the approved Scoping Report.

## 28.2 Motivation for the deviation

Not applicable.

# 29 Other information required by the Competent Authority

## 29.1 Impact on the socio-economic conditions of any directly affected person

No specific report was generated for the purposes of the socio-economic conditions. Current land uses inside the prospecting area, such as agriculture, may be temporarily impacted through the presence of the fenced areas that drill rigs will operate within. These will, however, be small areas. These areas will be rehabilitated post drilling activities and the areas will once again become available for agriculture. Other potential socio-economic impacts will include:

- Nuisance noise due to on site activities and drilling;
- Poor access control resulting in impacts on agricultural activities
- Influx of jobseekers to site, which may result in an increase in opportunistic crime;
- Uncontrolled access to private property outside of the demarcated boundaries; and
- Visual impact as a result of the vegetation clearance.

Prospecting will be undertaken by specialist sub-contractors, and it is not anticipated that employment opportunities for local and/or regional communities will result from the prospecting activities during the drilling phases.

Management and mitigation measures must be implemented to prevent environmental pollution which may impact on environmental resources utilised by communities, landowners, and other stakeholders. Measures to manage the potential impacts on communities, individuals or competing land uses in close proximity include:

- Noise due to construction activities and drilling:
    - Directly affected and adjacent landowners and land occupiers must be informed of the planned dates of the drilling activities and a grievance lodging mechanism must be made available to the stakeholders.
    - Site activities shall be concluded during daytime hours (0700 to 1730), to avoid night time noise disturbances and night time collisions with fauna.
- Poor access control resulting in impacts on agricultural activities:
    - Access control procedures must be agreed on with the farm owners and all on site personnel shall be trained on these procedures.
- Influx of job seekers to the site which may result in increased opportunistic crime:
    - Casual labour shall not be recruited at the site. This will eliminate the incentive for people to travel to site seeking employment. Where necessary, a recruitment centre may be established in the major town areas;
    - The landowners shall be notified on unauthorised persons encountered on site; and
    - Where necessary, the South African Police Service (SAPS) will be notified of unauthorised persons encountered on site.

- Visual Impact:
    - Wet dust suppression will be undertaken to manage nuisance dust from construction vehicle movements and other construction activities as and when necessary;
    - Ensure that the time period used for the drill rigs is optimised to ensure that the drill rigs are moved from one site to another over short periods;
    - Materials transported on public roads must be covered;
    - Raise the view range for parts where the digger will operate. Visually looking at a mound with trees will mitigate any form of visual impact on the site. It is a flat site so from a specific range the project should not be visible to its immediate surroundings;
    - Create buffer zones in the affected area. Rehabilitate the buffers, plant trees, and create a visual barrier between the affected area and the prospecting operation.
    - The portable ablution facilities and any other infrastructure will be acquired with a consideration for colour. Natural earth, green and mat black options which blend with the surrounding must be favoured;
    - A waste management system will be implemented, and sufficient waste bins will be provided for on site. A fine system must be implements to further prohibit littering and poor housekeeping practices; and
    - Vegetation cover shall be used where drill rigs will be located to minimise visual impacts.

## 29.2 Impact on any national estate referred to in Section 3 (2) of the National Heritage Resources Act

The HIA found two heritage resources sites located in the project area, a local burial site and a scatter of lithic tools. The identified burial site has social significance that must be put into consideration during prospecting. The graves are a focus of spiritual and religious significance. It should be noted that burial grounds and gravesites are accorded the highest social significance threshold. They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tempered with or interfered with without a permit from SAHRA. It should also be borne in mind that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present.

According to the PIA, the impact of the prospecting on the fossil heritage is high for the Kalahari and low for the Dwyka Group. The overburden and inter-burden must always be surveyed for fossils. Special care must be taken during the clearing, digging, drilling, blasting, and excavating of foundations, trenches, channels and footings and removal of overburden if applicable not to intrude fossiliferous layers.

The threats associated with the proposed project are:

- Earth moving equipment/machinery (front end loaders, excavators, graders, dozers) during construction, the sealing-in, disturbance, damage, or destruction of the fossils by development, vehicle traffic, prospecting, bulk sampling, and human disturbance; and

- The sealing-in or destruction of fossils by development, vehicle traffic, clearing, prospecting, and human disturbance.

A Phase 1 Palaeontological Impact Assessment: Phase 1 Field Study is recommended if fossils are found during excavating, drilling, or clearing (according to SAHRA protocol).

The HIA, PIA and EIA have included mitigation measures that must be implemented should any heritage resources be encountered during all phases of the project. A 100m buffer area around the burial site was demarcated as a no-go area where no project activities will be allowed (Figure 13-2).

Please refer to Section 13 of this report and the accompanying EMPr.

# 30 Other Matters required in terms of Sections 24 (4) (a) and (b) of the Act

Section 24(4)(b)(i) of the NEMA (as amended), provides that an investigation must be undertaken of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity.

Alternatives relating to site layout, infrastructure and operation activities were considered. The location of the proposed project components is constrained to the location with potential for the mineral resources (Diamond (Alluvial and Kimberlitic), Sand, Gravel, Trace Gold reserves). The project area is prospective for kimberlites as one known kimberlite body plots ~ 3 km to the West from the targeted block. Three sub rounded anomalies were derived from Google Earth image study and might be related to kimberlite pipes. Several linear anomalies might represent kimberlite dykes. All these anomalies are recommended as targets for kimberlite prospecting. In addition few fragments of severely weathered kimberlite were collected during site visit within project area. This confirms kimberlite presence within target area. Most of the project area is covered with Rooikoppie gravels of varying thickness. Thickness observed at several exposures varies from 10-15 cm up to ~ 1 metre. Rooikoppie are known to be diamondiferous. Gravels moved by water and redeposited were observed along drainage lines. Such gravels might have elevated grades.

As such, no property alternatives were viable to be considered for this project.

Since no complicated surface infrastructure will be required for this project no design and layout alternatives for the proposed project were determined. The heritage resources and wetlands specialists have recommended buffer areas within which no project activities may be allowed so as to minimise and/or avoid impacts and edge effects on the burial site and wetlands in the area. The no-go areas are shown in Figure 15-1.

The applicant will ensure that the final layout of the project excludes activities in the no-go area.

# Environmental Management Programme Report

# 31 Details of the EAP

## 31.1 Expertise of the EAP

### 31.1.1 Qualifications of the EAP

Please refer to Section 3.2.1.

### 31.1.2 Summary of EAPs past experience

Please refer to Section 3.2.2.

# 32 Description of the aspect of the activity

Please refer to Section 5 of this report.

# 33 Composite Map

The composite map is provided in Figure 33-1 and attached as Appendix 7. The composite map include:

- No-go areas: These are buffer areas determined by specialists where no activities and/or infrastructure may not be undertaken. The no-go areas were determined as follows:
    - Wetland Areas and associated 32m buffer: and
    - Burial site and associated 100m buffer.
- Red Flag Areas: These are areas that trigger activities listed in environmental legislation and will require authorisations and licenses. The identified red flag areas were identified as follows:
    - Water courses and 100m regulated buffer area (NWA);
    - CBAs (Listing Notice 3 of the NEMA); and
    - Wetlands and 500m buffer area (NWA) – Sections beyond the 32m no-go areas.

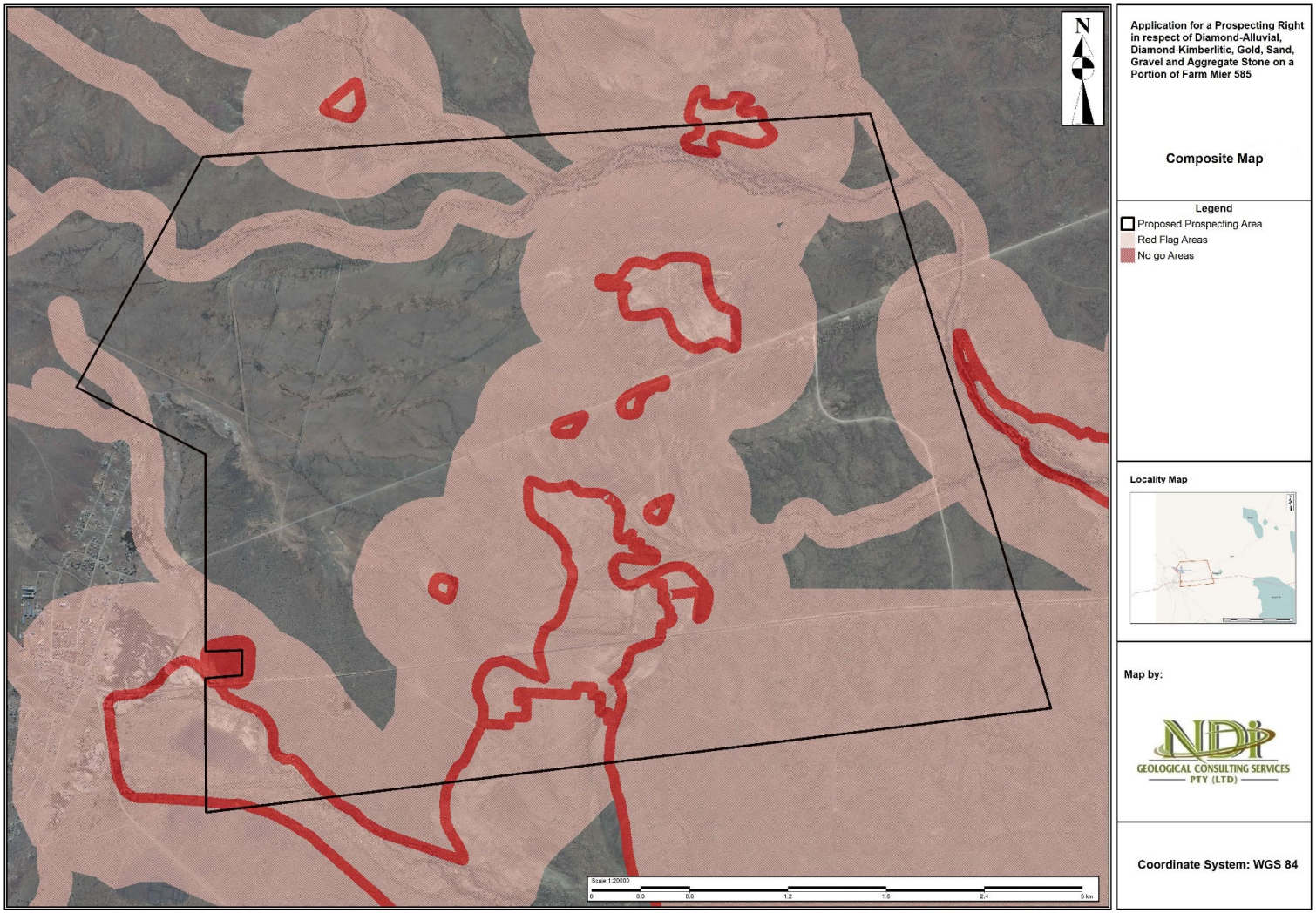


**Figure 33-1: Composite Map**

# 34 Description of impact management objectives including management statements

## 34.1 Determination of closure objectives

The main aim in developing a rehabilitation plan is to mitigate the impacts caused by the prospecting activities and to restore land back to a satisfactory end land use. The rehabilitation plan must be developed as early as possible and maintained throughout the life of operation. It is important that the project's closure plan is clearly defined and understood by all involved before starting the process and is complementary to the rehabilitation objectives.

Each phase of the prospecting activities is dependent on the success of the preceding phase. Depending on the findings from Phase 1, Phase 2 will be initiated. The location and extent of the drill sites and trenches can therefore not be determined at this stage of the process.

The rehabilitation plan was developed on the basis that the rehabilitated areas will be made safe, stable, non-polluting and will be able to support self-sustaining ecosystems, similar to surrounding natural ecosystems.

To ensure that the rehabilitation plan is aligned with the closure objectives, high-level risk assessment of the prospecting components was undertaken to establish the potential risks associated with therewith.

The closure objectives are to:

- Eliminate any safety risks associated with trenches//pits, drill holes and sump through adequate drill hole capping and backfilling;
- Eliminated any safety risks associate with the bulk sampling trenches;
- Prevent future environmental issues related to lateral movement through the boreholes by plugged and sealed with cement to prevent possible cross flow and contamination between aquifers;
- Remove and/or rehabilitate all pollution and pollution sources such as slimes dams, waste rock dump area, waste materials and spills;
- To establish rehabilitated areas to a state which with no susceptibility to soil erosion which may result in loss of soil, pollution of water resources;
- Restore disturbed areas and re-vegetate these areas with plant species naturally occurring in the area to restore the ecological function of the affected areas as far as practicable;
- Eliminate all alien invasive plant species from the disturbed areas
- Remove infrastructure that cannot be used by a subsequent landowner or a third party.
- Where buildings can be used by a third party, arrangements will be made to ensure their long-term sustainable use;
- Rehabilitate the disturbed land to a state that facilitates compliance with applicable environmental quality objectives,
- Landscape the rehabilitated areas in alignment with the surrounding topography to prevent the unnecessary pooling of water which will reduce the runoff in the catchment;

- Implement progressive rehabilitation measures, beginning during the construction phase wherever possible, reducing the overall visual impact;
- Physically and chemically stabilise any remaining structures to minimise residual risks;
- Leave a safe and stable environment for both humans and animals;
- To limit soil and surface/groundwater contamination by managing all water on site;
- Comply with local and national regulatory requirements;
- Form active partnerships with local communities to take care of management of the land after prospecting, where possible; and
- To maintain and monitor all rehabilitated areas following re-vegetation and, if monitoring shows that the objectives have been met, making an application for closure.

Successful rehabilitation must be monitored to ensure sustainability. This requires an understanding of the basic baseline environment, as well as project management to ensure that the rehabilitation program is a success.

## 34.2 The process of managing environmental impacts

All the identified impacts shall be mitigated as provided in Section 13 of this report. An Environmental Response Plan (ERP) is a process to respond rapidly and effectively to and manage emergency situations that may arise at the project site. The Emergency Preparedness and Response Code of Practice will be compiled in accordance with the following legislation:

- OHSAS 18001; and
- The MHSA.

In the event of an emergency, the ERP and applicable Procedure will be consulted, and the required actions implemented. To facilitate the effective implementation of the procedures, copies of the Emergency Response Plan will be placed in accessible and visible locations around the site, such as the site office and contractors' yards.

Temla 13 shall ensure that employees and contractors are adequately trained regarding the implementation of the EMPr, environmental legal requirements and obligations, and the ERP.

Environmental awareness is applicable to all personnel involved in the project including part time personnel who shall be trained so that they are aware of environmental obligations by the time they access the site. An ECO will be appointed to conduct training during site establishment and will be responsible for how the site will look like before the commencement of prospecting activities and how it looks like after rehabilitation. This will be to ensure that the site has been restored to its original state or to an acceptable level, and ensure the ERP is adequately applied in case of an emergency. Accordingly, training programmes and frequent emergency simulations is suggested to ensure that all personnel are aware of safety and emergency procedures.

In addition, a list of emergency contact numbers will be displayed at various locations around the site. If the emergency has the potential to affect surrounding communities, the communities will be alerted via alarm signals or contacted in person.

Personnel that do not comply or ignore training and instruction regarding this, should be fined based on their offensive. First time offenders may only get away with a written warning, depending on the seriousness of the offence. Second time offenders may be suspended or

fined depending on the decision made by the site manager who may consult with the ECO, contractor and Safety, Health, and Quality Officer of the proposed project.

## 34.3 Potential risk of Acid Mine Drainage

The potential risk for acid mine drainage was not determined as the proposed prospecting activities are not expected to be associated with any acid-producing wastes. Therefore, the proposed activities do not pose any potential risk of acid mine drainage.

## 34.4 Steps taken to investigate, assess and evaluate the impact of Acid Mine Drainage

Not applicable.

## 34.5 Measures to be put in place to remedy any residual or cumulative impacts from acid mine drainage

Not applicable.

## 34.6 Volume and rate of water use required for the mining operation

It is anticipated that approximately 10 000ℓ of water will be required for the process. The water will either be sourced from the municipality and brought onto site and trucked to the identified drill site or abstracted from the groundwater.

The option of abstracting groundwater will be confirmed, with the DWS and should groundwater abstraction be required, a Section 21 (a) water use licence will be required.

## 34.7 Has a water use licence been applied for?

Should groundwater be required as a source of water, a water use licence application will be submitted to the DWS for the abstraction of water. Furthermore, it is anticipated that a Section 21 (c) and (i) WUL may be required for any activities and/or infrastructure located within the 100-year floodlines as well as within 500m of wetlands.

## 34.8 Impacts to be mitigated in their respective phases

The full impact assessment with associated mitigation and management measures are presented in Section 13.

# 35 Impact Management Outcomes

**Table 35-1: Impact Management During the Pre-Construction and Construction Phase Mitigation Type**

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| Project Kick Off and Planning | | Social | Pre-Construction | • This EMPr must form part of the contractual agreements with the specific contractors. | Control potential deviations from the approved EMPr. | Ensure contractors are aware of the required management measures stipulated in the EMPr. | Condition of the EMPr is met |
| Project Kick Off and Planning | | Social | Pre-Construction, Construction and Decommissioning | • The contractor is expected to have safety "toolbox" talks in accordance with the risks and trends associated with the project. Proof of these talks shall be kept on site. | Control potential deviations from the approved EMPr. | Ensure all construction staff is familiar with the Environmental Awareness Plan. | Environmental Awareness is promoted |
| Project Kick Off and Planning | | Social | Pre-Construction | • The contractor will develop a specific emergency procedure and plan. | Control potential deviations from the approved EMPr. | Ensure that all staff is familiar with the emergency procedure and plan. | Environmental Awareness is promoted |
| Data Collection and Assessment (Desktop Study) | None | N/A | Pre-Construction | • N/A | Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study. | N/A | Remain within the ambits of the EMPr and EA. |
| Geological Mapping (Desktop Study) | None | N/A | Pre-Construction | • N/A | Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study. | N/A | Remain within the ambits of the EMPr and EA. |
| Planning for Drilling Surveys (Desktop Study) | None | N/A | Pre-Construction | • N/A | Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study. | N/A | Remain within the ambits of the EMPr and EA. |
| Site Establishment and site clearance for the construction of infrastructure:<br>• Prospecting areas<br>• Slimes Dam<br>• Waste Rock Dump Area<br>• Access Roads<br>• Chemical and diesel storage areas<br>• Temporary Workshop Facilities,<br>• Storage facilities<br>• Recovery plant site<br>• trenches/pits<br>• Topsoil stockpile areas | Groundwater and Surface water contamination | Groundwater and surface water | Pre-Construction and Construction | • No site establishment shall be permitted within sensitive landscapes;<br>• Avoid stripping of areas outside the construction sites and rehabilitate areas that may have been mistakenly stripped;<br>• Proper waste management facilities will be put in place at the campsite and construction sites.<br>• Any hydrocarbon spill from the site establishment will be remediated as soon as possible;<br>• No washing of vehicles shall be allowed outside demarcated areas. Washing bays for vehicles and other equipment shall be provided with appropriate soakaways, will be clearly demarcated, and will not be allowed to contaminate any surface runoff;<br>• Sufficient areas shall be provided for the maintenance and washing of vehicles;<br>• Refuelling of vehicles will only be allowed in designated areas;<br>• All construction equipment shall be parked in a demarcated area Drip trays shall be used when equipment is used for some time;<br>• On surface bulk storage of hydrocarbons must be situated in a dedicated area which will include a bund or a drain where necessary to contain any spillages during the use, loading and off-loading of the material; | Control through management and monitoring of spillages. Where spillages occur, the soil must be stripped and disposed of as stipulated in the EMPr. | Implementation of the mitigation measures will ensure that the quality of streams and groundwater within the site will comply with the DWS target water quality objective and construction will be in compliance with the regulations under the GN704.<br>Temla 13 will be required to obtain all necessary authorisations in terms of Section 21 of the National Water Act (No.36 of 1998) where specific targets will be set to ensure the protection of water resources in the area | Retain topsoil integrity for the reuse in rehabilitation<br>Vegetation clearance shall be kept to a minimum. No clearance of vegetation outside demarcated areas |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
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| | | | | • Bunded areas shall contain 110% of the stored volume;<br>• Bund areas must be impermeable;<br>• Bund area must have a facility such as a valve/sump to drain or remove clean stormwater,<br>• Place oil traps under stationary machinery, only re-fuel machines at fuelling station, construct structures to trap fuel spills at fuelling station, immediately clean oil and fuel spills and dispose contaminated material (soil, etc.) at licensed sites only.<br>• Draw-up and strictly enforce procedures for the storage, handling, and transport of different hazardous materials.<br>• Ensure vehicles and equipment are in good working order and drivers and operators are properly trained.<br>• Contaminated water shall be pumped into a container for removal by an approved service provider;<br>• Regular inspections shall be carried out to ensure the integrity of the bundwalls;<br>• All preventative servicing of earth moving equipment and construction vehicles shall conducted off site;<br>• Runoff from this area shall be contained; and<br>• Spill kits shall be made available, and all personnel shall be trained, and training records shall be made available on request. | | | |
| | Wetland destruction and loss of wetland habitat and hydrological functions | Wetland and Aquatic Environmental Impacts | Pre-Construction and Construction | • Access to wetlands and associated 32m buffer area shall be strictly prohibited, unless authorised by the DWS.<br>• Access to wetland areas outside of the construction areas shall be strictly forbidden and the wetlands must be demarcated as no-go areas for vehicles and construction personnel;<br>• No vegetation clearance shall be permitted outside the footprints of the project infrastructure;<br>• No construction activities may be undertaken within 500 m from the edge of the wetlands and riparian zones without consent from the DWS;<br>• The stormwater management plan developed for the project (Hydrology Report) must be incorporated into the design of the project in order to prevent erosion and the associated sedimentation of the aquatic system;<br>• The dirty water systems should be adequately sized as per the GN704 Regulatory Requirements (have the capacity to cater for a 1:50 year flood occurring over a 24-hour period), to prevent failure thereof and ultimately, discharge of contaminated water into the wetlands;<br>• No vehicles may be allowed to indiscriminately drive through the riparian areas and wetland areas;<br>• All disturbed areas shall be re-vegetated with indigenous species;<br>• All construction materials shall be kept out of the wetlands and riparian areas; | Prohibit access to wetland areas and within the 32 m ZOI determined by the specialist.<br>No activities within 500m of wetlands without an authorisation from the DWS | Implementation of mitigation measures will assist with avoiding loss of and maintaining the current state wetland features within the project area and will enable the project to comply with the requirements of the NWA | Wetland loss is avoided and impacts on wetland habitat is reduced and/or avoided |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
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| | | | | • All vehicles shall be regularly inspected for leaks. Re-fuelling must take place outside the project area, on a sealed surface area to prevent ingress of hydrocarbons into topsoil and aquatic ecosystem<br><u>With regards to ground-breaking activities (within the 500m GN509 ZOR but outside the 32m GN704 ZOR):</u><br>• During excavation activities, the topsoil and vegetation should be stockpiled separately from other material outside of the 32m buffer area;<br>• Excavated materials should not be contaminated, and it should be ensured that the minimum surface area is taken up. However, the stockpiles may not exceed 3m in height. The mixture of the lower and upper layers of the excavated soil should be kept to a minimum, so as for later use as backfill material after construction has commenced; and<br>• All exposed soils must be protected for the duration of the construction phase to prevent potential erosion and sedimentation of the wetlands.<br><u>With regards to backfilling of excavated areas:</u><br>• Stockpiled material should be used as backfill material;<br>• All excavated areas should be backfilled to the natural ground level with excavated material;<br>• Soil must be lightly recompacted to a depth of 450 mm, and all construction material must be removed from the site upon the completion of construction or used in the rehabilitation process.<br><u>With regards to concrete mixing on site:</u><br>• No mixed concrete may be deposited outside of the designated construction footprint;<br>• Protective equipment should be provided, onto which any mixed concrete can be deposited while it awaits placing; and<br>• Concrete spilt outside of the demarcated area must be promptly removed and taken to a suitably licensed waste disposal site | | | |
| | Contamination of surface water resources | Surface water resources | Pre-Construction and Construction | • Where possible construction activities must be conducted in the dry season;<br>• Silt bunds shall be used to trap;<br>• The footprint area of all proposed infrastructure should be limited to what is necessary.<br>• Disturbance to the surrounding natural habitat should be kept to a minimal;<br>• It must be ensured that, as far as possible, all proposed infrastructure, including temporary infrastructure, is placed outside of sensitive habitat units;<br>• Ensure that topsoil is properly stored, away from streams and drainage areas;<br>• Vehicle and personnel movement within watercourses shall be strictly prohibited;<br>• Adequate stormwater management must be incorporated into the design of the project in order to prevent contamination of water courses from dirty water. | Monitoring through rehabilitation and management of spills<br>Rehabilitate contaminated areas<br>Implement the stormwater management plan to be compiled for the project | Implementation of the mitigation measures will ensure that the quality of streams and groundwater within the site will comply with the target DWS target water quality objective and construction will be in compliance with the regulations under the GN704. | Surface water quality Impact avoided/minimised |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
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| | | | | • Refuelling areas will be bunded and nozzles protected from spillage during refuelling;<br>• Vehicular access to the stream will be restricted;<br>• All spillages will need to be cleaned up as soon as practically possible;<br>• Proper management of stormwater drainage infrastructure should be ensured;<br>• Hazardous substances stored on site will be stored within a designated bunded areas fitted with a sump and value. Collection of water within the bunded areas will be deemed hazardous and disposed of as such;<br>• Bunded areas will be watertight and inspected for leaks on a frequent basis;<br>• Leaks to the bunded areas will be rectified as soon as possible;<br>• Drip trays will be utilised for the collection of leaks from vehicles and machinery parked for long period of time;<br>• Should a spill occur, this will be handled at the source of the leak and prevented from transpiring to nearby watercourse;<br>• Ensure that routine maintenance on all vehicles is undertaken as per maintenance schedule and records are kept;<br>• Sewage spillages shall be treated as hazardous waste and will be handled as such.;<br>• Where necessary, and as defined when the final detailed project design is confirmed, construct sediment collection paddocks downstream of the working activities to minimise uncontrolled runoff from the site;<br>• Minimise the areas that are to be stripped of vegetation;<br>• Adequate storm water management should be considered in the detailed design of the proposed infrastructure in order to minimize undue erosion;<br>• Erosion can also be limited by ensuring that prospecting vehicles and human movement is limited to project specific dedicated access ways;<br>• Stormwater runoff will be directed towards natural watercourses;<br>• Construction will be undertaken during the dry season, where possible, to minimise the potential for stormwater runoff; and<br>• Routine surface water quality monitoring up and down stream of construction activities and position of infrastructure and activities associated with the Project will be undertaken on a monthly basis. | | | |
| | Loss of Species of Conservation Concern | Biodiversity | Pre-Construction and Construction | • Prior to the commencement of construction activities the entire construction servitude, including lay down areas and stockpile areas etc., must be fenced off and clearly demarcated, including no-go zones;<br>• Prior to the commencement of construction activities on site an alien vegetation management plan should be compiled for implementation throughout the construction and operational phases; | Rehabilitation of areas cleared of vegetation.<br>Control of alien invasive plant species | The implementation of mitigation measures will ensure that the establishment of the construction site and associated infrastructure/equipment do not have detrimental impact on the area's flora, in particular indigenous species and species | Rehabilitation standards and flora SCC are protected No Alien Invasive Plant Species in the area |

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| | | | | • Prior to the commencement of construction activities on site a rehabilitation plan should be developed for implementation throughout the development phases<br>• No stripping of topsoil and vegetation will be allowed during site establishment;<br>• Any area that may result into the disturbance of the vegetation cover must be rehabilitated immediately on discovery;<br>• Cutting down, relocation or disturbance of floral SCC not affected by the project shall be strictly forbidden;<br>• The floral SCC are to be handled with care and the relocation of sensitive plant species to suitable similar habitat is to be overseen by a botanist;<br>• The proposed development footprint shall be kept to the minimum;<br>• Where possible disturbed areas must be concurrently rehabilitated during construction;<br>• Prohibit the collection of any plant material for firewood or medicinal purposes;<br>• The existing integrity of flora surrounding the study area shall be upheld and no activities shall be carried out outside the footprint of the construction areas;<br>• Edge effect control shall be implemented to avoid further habitat degradation outside of the proposed footprint area;<br>• Protected floral species occurring within the vicinity of the study area, but outside the disturbance footprint shall be fenced for the duration of the construction activities;<br>• Construction vehicles shall only be allowed on designated roadways and access roads to limit the ecological footprint of the project;<br>• Edge effects of activities including erosion and alien/ weed control will be strictly managed in the affected areas;<br>• All sites disturbed by construction activities shall be monitored for colonisation by exotic or invasive plants;<br>• A bi-annual alien vegetation clearance programme should be implemented during the construction phase in order to prevent the establishment of alien and invasive plants;<br>• A rehabilitation plan shall be developed for implementation throughout the development phases; and<br>• Exotic or invasive plants shall be controlled as they emerge. | | that are of conservation importance. | |
| | Migration of animal life due to disturbance caused proposed project: | Biodiversity | Pre-Construction and Construction | • The proposed development footprint areas shall remain as small as possible and where possible be confined to already disturbed areas;<br>• Site activities will be conducted during daytime hours 07h00 – 17h30 to avoid night-time noise disturbances and night-time collisions with fauna; | Relocation of affected species of conservation importance<br>Management of site activities | Mitigation measures will ensure that the animal life within in the project is not affected by the proposed project. | Rehabilitation standards and fauna habitats are protected |

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| | | | | • Vehicle speed will be reduced, particularly in highly vegetated areas to avoid deaths by vehicle impacts;<br>• No trapping or hunting of fauna shall be permitted;<br>• Uncontrolled and unauthorised fire shall be strictly prohibited;<br>• Where a burning regime is implemented, this should be overseen by a qualified and experienced professional;<br>• The prospecting and construction personnel should be informed about fire control and prevention measures to reduce the frequency of uncontrolled veld fires in areas surrounding and within the project area;<br>• A fire management plan shall be developed and implemented in case of unplanned fire<br>• Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which may affect faunal habitat, need to be strictly managed;<br>• Should any faunal SCC be encountered within the study area, these species will be relocated to similar habitat within or in the vicinity of the study area with the assistance of a suitably qualified specialist;<br>• No informal fires in the vicinity of construction areas shall be permitted;<br>• An alien vegetation control plan must be developed and implemented in order to manage alien plant species occurring within the study area, and to prevent further faunal habitat loss; and<br>• Poaching will be prohibited. | | | |
| | Mortality and disturbance of fauna | Biodiversity | Pre-Construction and Construction | • Death/injury during vegetation clearing and earth works<br>  ○ An Environmental Control Officer (ECO) should be on-site during vegetation clearing to monitor for, and manage, any wildlife-human interactions. The ECO should be trained in inter alia, snake handling; and<br>  ○ Where appropriate, fences should be erected to prevent fauna gaining access to construction and operational areas, such as open trenches and voids.<br>• Vehicle-wildlife collisions<br>  ○ Road signage indicating the potential presence and movement of wildlife should be installed within the construction footprints and along public roads.<br>• Hunting, snaring, and poisoning<br>  ○ The handling, poisoning, and killing of on-site fauna by the construction workers and contractors must be strictly prohibited; and<br>  ○ Employees and contractors should be made aware of the presence of, and rules regarding, fauna through suitable induction training and on-site signage.<br>• Noise, vibrations, and lights (sensory disturbances) | Management of site activities | Mitigation measures will ensure that the animal life within in the project is not affected by the proposed project. | Rehabilitation standards and fauna SCC are protected |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
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| | | | | ○ General noise abatement equipment should be fitted to machinery and vehicles;<br>○ As required, noise shields, including earth berms, should be constructed around sites of noise origin;<br>○ Dust suppression using water bowsers/sprayers should be undertaken on all sites/facilities where dust entrainment occurs; and<br>• Plan the lighting requirements of facilities to ensure that lighting meets the need to keep the site secure and safe, without resulting in excessive illumination. Possible options include:<br>○ Zoning of areas of high and low lighting requirements;<br>○ Movement activated lights as opposed to permanent lights; and<br>○ Reducing height and angle of lights. | | | |
| | Loss of soils, erosion of the soils and impacts on landowner's livelihood | Soils, landuse and Land Capability | Pre-Construction and Construction | • A spill prevention and emergency spill response plan shall be compiled to guide the construction works;<br>• An emergency response contingency plan shall be put in place to address clean-up measures should a spill and/or a leak occur.<br>• No soil stripping will be allowed during site establishment;<br>• Should it be necessary to conduct geophysical surveys and geological mapping, ensure minimal disturbance of soil;<br>• Any activity that may result in the disturbance of the soils must be rehabilitated immediately on discovery;<br>• Access roads should be designed with a camber to avoid ponding and to encourage drainage to side drains; where necessary, culverts should be installed to permit free drainage of existing water courses;<br>• Losses of fuel and lubricants from the oil sumps and steering racks of vehicles and equipment shall be contained using a drip tray filled with absorbent material;<br>• Any hydrocarbon spill from the site establishment will be remediated as soon as possible;<br>• Contaminated soil shall be removed and disposed of to an appropriate licensed landfill site in terms of NEM: WA, or can be removed by a service provider that is qualified to clean the soil;<br>• The time in which soils are exposed during construction activities should remain as short as possible;<br>• Erosion control measures shall be implemented where deemed necessary;<br>• In general, all steep slopes steeper than 1:3 or where the soils are more prone to erosion must be stabilised; | Retain topsoil integrity for the reuse in rehabilitation<br>Vegetation clearance shall be kept to a minimum. No clearance of vegetation outside demarcated areas | Implementation of mitigation measures will ensure that the activities in the development of the construction sites and associated infrastructure do not have detrimental impacts on the soils, land use and land capability. | Rehabilitation standards, end use objectives |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
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| | | | | • Institute adequate sedimentation control measures where necessary when excavation or disturbance of the riverbanks takes place;<br>• The time in which soils are exposed during construction activities shall be kept to a minimum;<br>• If stockpiles are not going to be used immediately the stockpiles shall be rehabilitated to prevent erosion and resulting in the increase in turbidity;<br>• Runoff from stockpiles shall be detained in order to support growth of vegetation;<br>• Minimise stockpile height to <3m.<br>• Topsoil should never be used as a filling material for roads<br>• Soil stockpiles must be sampled, ameliorated (if necessary) and re-vegetated as soon after construction as possible.<br>• Runoff from the stockpiles shall be suitably managed to ensure that the runoff volumes and velocities are similar to pre disturbed levels;<br>• Separate stripping, stockpiling, and replacing of soil horizons in the original natural sequence to combat hard setting and compaction, and maintain soil fertility;<br>• Stockpiles height should be restricted to that which can deposited without additional traversing by machinery;<br>• Maximum height vegetation shall be used to promote infiltration of water into the stockpile instead of increasing runoff;<br>• A monitoring programme will be implemented if the stockpiles are not used within the first year whereby the vegetation of the stockpiles is monitored in terms of basal cover and species diversity;<br>• If it is noticed that the vegetation on the stockpiles is not sustainable, appropriate corrective actions shall be taken to rectify the situation; and<br>• Stockpiles shall be maintained until the topsoil is required for rehabilitation purposes | | | |
| Transportation of material and movement of vehicles and machinery on construction areas | Possible increase in nuisance dust and carbon emissions and ambient air pollutants ($NO_2$ and $SO_2$) due to movement of vehicles and operation of machinery and equipment | Air Quality | Pre-Construction and Construction | • Use dust suppression techniques such as wet suppression or chemical suppression (must be environmentally friendly and non-polluting) to reduce dust on roads that exhibit an increase of dust emitted from the entrainment of dust.<br>• Dust suppression measures shall be implemented on dry weather days and periods of high wind velocities;<br>• Rehabilitation of disturbed areas shall be undertaken in tandem with construction activities;<br>• Limit load size to reduce spillage and cover final product loads with tarpaulins where needed.<br>• Attend to dust control when loading trucks by minimising drop heights and prevention of over loading.<br>• A routine emissions and ambient air quality monitoring program shall be developed and implemented to determine whether there are any | Dust control measures<br>Dust fallout monitoring | With the implementation of the mitigation measures, the construction will be undertaken such that the ambient air quality does not exceed the National Air Quality Standards. | Dust and Particulate Matter levels |

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| | | | | significant increases in emissions and impacts at sensitive receptors.<br>• A speed limit of 40 km/hr shall apply to limit vehicle entrained dust from the unpaved roads;<br>• All construction equipment must be scheduled for preventative maintenance to ensure the functioning of the exhaust systems to reduce excessive emissions and limit air pollution;<br>• Design road alignments to minimise travel distances and eliminate unnecessary traffic<br>• Appropriate dust suppression measures may include limiting the extent of open areas, reducing the frequency of disturbance, and spraying with water; and<br>• A routine emissions and ambient air quality monitoring program shall be developed and implemented to determine whether there are any significant increases in emissions and impacts at sensitive receptors.<br>• Odours:<br>o Putrescible waste must be handled, stored, and disposed of before the probability of it generating odours;<br>o Chemical toilets must be emptied / serviced on a regular basis. Proof of this must be provided to the Engineer;<br>o All the construction vehicles shall undergo maintenance on a regular basis to improve on the combustion engine vehicle efficiency; and<br>o Traffic will be restricted to demarcated areas and traffic volumes and speeds within the construction site will be controlled. | | | |
| Vegetation clearance and excavation of construction sites | Visual intrusion as a result of movement of machinery and erecting of contractor camps as well as clearance of vegetation | Visual | Pre-Construction and Construction | • The relevant exposed construction site areas and access gravel roads will be irrigated on a regular basis, with just enough moisture to keep the dust down without creating undue runoff;<br>• Natural vegetation, wherever practical, must be retained on and around the construction sites;<br>• All lights used for illumination (except for lighting associated with security) should be faced inwards and shielded to avoid light escaping above the horizon;<br>• Construction site will be screened from sensitive receptors and rubble removed from site on a daily basis;<br>• Litter and dust management measures should be in place at all times;<br>• Maintain the construction site in a neat and orderly condition at all times;<br>• Create designated areas for material storage, waste sorting and temporary storage, batching and other potentially intrusive activities;<br>• Limit the physical extents of areas cleared for material laydown, vehicle parking and the like as | Control and keep to a minimal the number of vehicles used for construction. Vehicles must be maintained to ensure efficient use of fuel. | Measures will be undertaken to ensure that the visual aspects from the site are complying with the relevant visual standards and objectives and ensure that all operations during the construction phase do not result in detrimental visual impacts on surrounding properties, communities, and road users. | Rehabilitation standards<br>Traffic impacts reduced |

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| | | | | much as possible and rehabilitate these as soon as is feasible;<br>• Repair unsightly and ecologically detrimental erosion damage to steep or bare slopes as soon as possible and re-vegetate these areas using a suitable mix of indigenous plant species.<br>• To reduce the visual intrusion of the buildings, roofing and cladding material should not be white or shiny (e.g. bare galvanised steel that causes glare);<br>• Construct and/or paint offices and workshop buildings in colours that are complementary to the surrounding landscape, such as olive green, light grey, grey green, blue grey, dark buff, rust, ochre variations of tan;<br>• Utilise construction materials that have matt textures where possible; and<br>• On site construction activities will be limited to be undertaken between 6am and 6pm. | | | |
| Transportation of material and movement of vehicles and machinery on construction areas | Increase in ambient noise levels due to movement of vehicles and machinery | Noise | Pre-Construction and Construction/Operation | • Conduct baseline noise monitoring prior to construction activities;<br>• Implement a noise monitoring programme to measure against the baseline noise assessment;<br>• The maximum speed limit shall be limited to 40 km/hr subject to risk assessment;<br>• Less noisy equipment will be used, the equipment will be kept in good working order and the equipment will be fitted with correct and appropriate noise abatement measures;<br>• Ensure that the employees are issued with earplugs and that they are instructed to use them;<br>• Educate employees on the dangers of hearing loss due to prospecting machinery noise;<br>• Adjacent landowners must be advised of any work that will take place outside of normal working hours, that may be disruptive (e.g. noise) in advance;<br>• Surrounding communities must be notified in advance of noisy construction activities;<br>• All equipment should be provided with standard mufflers;<br>• Muffling units on vehicles and equipment must be kept in good working order;<br>• Construction staff working in areas where the 8-hour ambient noise levels exceed 85 Dba should wear ear protection equipment;<br>• Where possible, operation of several equipment and machinery must be avoided;<br>• All equipment must be kept in good working order, with immediate attention being paid to defective silencers, slipping fanbelts, worn bearings and other sources of noise;<br>• Equipment must be operated within specifications and capacity (e.g. no overloading of machines);<br>• Regular maintenance of equipment must be undertaken, particularly with regard to lubrication; | Management and maintenance of construction vehicles. Management using noise dissipating technologies e.g. noise mufflers<br>Control through the limiting of the activities to the daytime and the implementation of an open and transparent channel of communication | The mitigation measures ensure that the noise levels from the construction sites will be managed, and measures will be taken to ensure that noise levels are below the National Noise Control Regulations, SANS 10103:2008 Guidelines and will ensure that the noise levels emanating from the construction sites will not have detrimental effects on the construction workers and surrounding communities/land owners. | Noise levels |

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| | | | | • Equipment must be operated in such a way that the equipment is operated throughout the working periods instead of operating several items simultaneously;<br>• Equipment shall be switched off when not in operation;<br>• Appropriate directional and intensity settings must be maintained on all hooters and sirens;<br>• The Contractor must ensure that the employees conduct themselves in an appropriate manner while on site;<br>• Adjacent landowners shall be notified in writing if work needs to be carried out after hours;<br>• Noise/vibration producing activities shall be limited to daylight hours (Monday to Friday 07H00 to 17H30 and Saturday 07H00 -14H00). However, no noise/vibration producing activities shall be undertaken on Saturdays unless this has been agreed to by the community. | | | |
| Vegetation clearance and excavation of construction sites | Potential destruction of graves and areas of archaeological importance | Heritage Resources | Pre-Construction and Construction/Operation | • Access to the identified burial site and 100m buffer shall be strictly prohibited. The site must be mapped on the prospecting plan to avoid any accidental damage. Should it be necessary, the site must be barricaded by a danger warning tape to avoid any accidental damage during prospecting.<br>• A copy of the chance finds procedure must be kept at the site office to ensure appropriate management of any accidental finds during prospecting.<br>• Contractors shall be made aware of the archaeological resources that were identified during the HIA;<br>• Should any archaeological or physical cultural property heritage resources be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped until heritage authority has cleared the development to continue.<br>• Should any archaeological, cultural property heritage resources be exposed during excavation or be found on development site, a registered heritage specialist or PHRA official must be called to site for inspection.<br>• Should remains and/or artefacts be discovered on the development site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Construction Manager who in turn will inform Northern Cape PHRA;<br>• Should any remains be found on site that is potentially human remains, the Northern Cape PHRA and South African Police Service should be contacted.<br>• Under no circumstances shall any artefacts be removed, destroyed, or interfered with by anyone on the site without approval from SAHRA | Control through clear demarcation of construction sites to ensure avoidance of burial site and 100m buffer area and other heritage sites | The construction will be undertaken in compliance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999) and recommendations from the specialist. The mitigation measures will ensure that the construction activities do not have detrimental impacts on heritage sites | Impact avoided |
| Vegetation clearance and excavation of construction sites | Potential sealing and loss of fossils | Fossils | Pre-Construction and Construction/Operation | • If any palaeontological material is exposed during digging, excavating, or blasting, SAHRA must be notified. All development activities must be stopped, | Management of topsoil integrity for the reuse in rehabilitation | The construction will be undertaken in compliance with the requirements of the National | Impact avoided |

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| | | | | and a palaeontologist should be called in to determine proper mitigation measures, especially for shallow cave | | Heritage Resources Act, 1999 (Act 25 of 1999) and recommendations from the specialist. The mitigation measures will ensure that the construction activities do not have detrimental impacts on fossil resources | |
| Waste Management | Improper waste management has potential to contaminate water resources | Water resources (wetlands, surface, and groundwater) | Pre-Construction and Construction/Operation | *Separation of waste*<br>• All waste shall be separated into general waste and hazardous waste;<br>• Hazardous waste shall not be mixed with general waste and in doing so increase the quantities of hazardous waste to be managed;<br>• General waste can further be separated in waste that can be recycled and or reused;<br>• No littering shall be allowed in and around the site, a sufficient number of bins shall be provided for the disposal of waste;<br>• Where necessary dedicate a storage area on site for collection of construction waste.<br>*Storage of waste:*<br>• No stockpiling of material shall be permitted within 32m of the wetland areas, 100 m of water courses and/or drainage lines or 1:100year floodlines<br>• General waste will be collected in an adequate number of litter bins located throughout the construction site Bins shall be located no more than 50 m from construction sites;<br>• Bins must have lids in order to keep rainwater out;<br>• Bins shall be emptied regularly to prevent the bins from overflowing;<br>• All work areas shall be kept clean and tidy at all times;<br>• All waste management facilities will be maintained in good working order;<br>• Waste shall be stored in demarcated areas according to type of waste;<br>• Runoff from any area demarcated for waste will be contained, treated, and reused;<br>• Flammable substances must be kept away from sources of ignition and from oxidizing agents;<br>• Waste shall not be buried or burned on site; and<br>• The maximum retention time for temporary storage of waste generated shall not exceed 30 days, provided the waste does not present a health hazard or risk of odour;<br>*Disposal of hazardous waste:*<br>• No dumping shall be allowed in or near the construction site;<br>• Hazardous containers shall be disposed of at an appropriate licensed site;<br>• Hazardous waste will be removed and managed by an approved service provider; | Waste management | The mitigation measures will result in reduced the amounts of waste produced, will encourage re-use of material where possible and recycling of the material where possible. Disposal will be utilised as the last resort. The mitigation measures will also ensure that the management of waste will be in accordance with the National Environmental Management: Waste Act, 2008 (Act 51 of 2008) | Waste Management<br>Impact on water resources avoided |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
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| | | | | • A safe disposal certificate will be provided by the approved service provider as proof of responsible disposal of hazardous waste; and<br>• The safe disposal certificate shall be stored and provided on request;<br>• Disposal of general waste:<br>• No dumping shall take place in or near the construction site;<br>• All general waste shall be disposed of to the nearest licensed landfill site;<br>• Demolition waste and builder's rubble shall be disposed of to an appropriate licensed landfill site; and<br>• The necessary permissions must be obtained to dispose of waste to a registered landfill site | | | |
| Vegetation clearance | Changes in the topography may be experienced as a result of bush clearing and construction vehicles on site | Topography | Pre-Construction and Construction/Operation | • Bush clearance will only take place in designated areas and kept as minimal as possible;<br>• Construction foots prints shall be kept demarcated and to a minimum<br>• Rubble will be removed frequently;<br>• The construction activities will be screened to minimise the visual disturbance to surrounding landowners. | Control of the construction footprints and ensuring that vegetation clearance shall be kept to a minimum. No clearance of vegetation outside demarcated areas. | Implementing mitigation measure will minimise changes in topography and visual impacts | Rehabilitation standards<br>End use objectives |
| Excavations | Removal of local geology as a result of construction activities | Geology | Pre-Construction and Construction/Operation | | | | |
| Transportation of material and movement of vehicles and machinery on construction areas | Increased traffic on public roads may result in conflicts | Traffic/Social | Pre-Construction and Construction/Operation | • Ensure that where existing public roads are used to access the construction areas, adequate construction signage is in place to inform the public of increased construction activities in the affected areas;<br>• Traffic signs shall be installed around the project site and surrounding areas to warn community road users of the presence of construction vehicles;<br>• Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads;<br>• Where possible the transportation of construction materials and rubbish shall be undertaken outside traffic peak hours to minimise inconveniencing residents;<br>• The number of construction vehicles and trips shall be kept to a minimum<br>• Materials transported on public roads must be covered. | Speed control and limitation of the times when construction vehicles may be on the roads | Implementing mitigation measure will ensure road safety along the public roads and onsite and to increase awareness of slow-moving vehicles | Impact avoided |
| Recruitment | Impact from the influx of job seekers and employment of farm labourers: | Social | All phases | • Recruitment will not be undertaken on site;<br>• Recruitment process shall favour locals;<br>• Where required, liaise with the SAPD to ensure safety of landowners in the areas;<br>• Prepare an influx management plan<br>• Develop a local employment procedure and recruitment process<br>• Prepare a code of conduct for all workers and contractors associated with the project | Management of the implementation of recruitment policies and processes | Implementing mitigation measures will ensure recruitment of locals and will minimise conflicts with surrounding landowners and communities. | Impact managed/reduced |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| | | | | • Ensure that employees are provided with adequate health support, including the dissemination of the Health and Safety Policy and the HIV/AIDS policy<br>• Ensure that employees are provided with any other awareness training required as part of the general employment contract with contract or permanent staff<br>• Monitor for any escalation of poaching, petty crime, or establishment of illegal settlements on land surrounding the project. Such cases need to be addressed immediately and appropriately | | | |

**Table 35-2: Impact Management During the Operational Phase**

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| Disposal of waste rock on the waste rock dump | Fugitive dust and fine particulate emissions affecting ambient air quality | Air quality | Operation | • The waste rock disposal facility should be well maintained to ensure that the deposited waste material does not accumulate to form any sharp edges. Sharp edged are prone to wind erosion and the generation of dust plumes from such facilities;<br>• Progressive rehabilitation should be implemented on the disposal facility to reduce wind erosion ads the generation of fugitive dust;<br>• If the facility is observed as generating significant dust plumes, appropriate; and<br>• Mitigation measures should be implemented to reduce the emission levels such as the installation of suitable wind breaks, and or wet suppression. | Soil monitoring and management of spills<br>Groundwater and surface water monitoring | With the implementation of the mitigation measures and monitoring of the air quality, the prospecting activities will be undertaken such that the ambient air quality does not exceed the National Air Quality Standards. | Dust levels<br>Particulate Matter levels |
| Transportation of product | Fugitive dust and fine particulate emissions affecting ambient air quality | Air quality | Operation | • Wet suppression on unpaved plant roads with water and a suitable dust palliative to achieve the 95% control efficiency (water alone will only achieve a 75% control efficiency) should be implemented;<br>• Rigorous speed control and the institution of traffic calming measures to reduce vehicle entrainment. A recommended maximum speed of 30 km/h to be set on all unpaved roads and 45 km/h on paved roads within the project site;<br>• Load wet suppression of materials transported by road (i.e. load spraying) or load covering with tarpaulins to reduce fugitive dust generation;<br>• Reduction in unnecessary traffic volumes by developing plans to optimise vehicle usage and movement;<br>• Avoidance of dust track-on onto neighbouring paved roads; and<br>• Wind speed reduction through sheltering (where possible). | Soil monitoring and management of spills | | |
| Fugitive vehicle emissions from the gravel maintenance road | Fugitive dust and fine particulate emissions affecting ambient air quality | Air quality | Operation | • Wet suppression on unpaved plant roads with water and a suitable dust palliative to achieve the 95% control efficiency (water alone will only achieve a 75% control efficiency) should be implemented;<br>• Rigorous speed control and the institution of traffic calming measures to reduce vehicle entrainment. A recommended maximum speed of 30 km/h to be set on all unpaved roads and 45 km/h on paved roads within the project site; | Dust control<br>Air quality monitoring | With the implementation of the mitigation measures and monitoring of the air quality, the prospecting activities will be undertaken such that the ambient air quality does not exceed the National Air Quality Standards. | Dust levels<br>Particulate Matter level |
| Heavy vehicle exhaust emissions | CO, $NO_2$, $SO_2$ and fine particulate emissions affecting ambient air quality | Air quality | Operation | • All vehicles and other equipment should be maintained and serviced regularly to ensure that exhaust particulate emissions are kept to a minimum;<br>• Vehicles should use low sulphur fuels; and<br>• Vehicles should not be allowed to idle for more than 5 minutes when not in use to reduce particulate and combustion emissions. | Air quality monitoring | | Particulate Matter level |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| Stockpiling of discard and waste rock.<br>Storage within slimes dams | Soil contamination due to leaching of soluble product and waste constituents into soils underlying the stockpiles; and Contamination of soil adjacent to product and waste stockpiles due to run-off or seepage of soluble product or waste rock constituents. | Soil, Land Use and Land Capability | Operation | • Implement suitable measures on infrastructure such as the waste dump areas to minimise soil contamination by controlling seepage and runoff.<br>• Implementing regular site inspections for materials handling and storage.<br>• Re-use stockpiled soil within as short a period as possible (within 3-5 years). Strip and stockpile soils from seasonal pans separately, ideally in a similar landscape position to its origin, i.e. valley bottom. | Management and motoring of integrity of infrastructure | Implementation of mitigation measures will ensure that the prospecting activities do not have detrimental impacts on the soils, land use and land capability.<br>. | Rehabilitation standards<br>End use objectives |
| Spills of chemicals (e.g., hydrocarbon).<br>Soil contamination on adjacent land potentially occurring due to inappropriate waste disposal and potential oil and diesel leakages from vehicles and machinery | Contamination of soils by hydrocarbon pollutants | Soil, Land Use and Land Capability | Operation | • Accidental spills (concrete, chemicals, process water, hydrocarbons, waste) need to be reported as soon as practical so that effective remediation and clean-up strategies and procedures can be implemented.<br>• Where possible, soil that is contaminated by fuel or oil spills, for example, from vehicles, will be collected to be treated at a pre-determined and dedicated location, or will be treated in situ, using sand, soil as absorption medium.<br>• Practice good housekeeping in chemical storage areas and ensure that storage areas are bunded.<br>• Remedy by treatment of contaminated soils. | Management and monitoring of spills | | |
| Bulk Sampling | Contamination of groundwater resource due to seepage from waste dump areas and slimes dams into the local groundwater and subsequently decrease the water quality in the local area | Groundwater | Operation | • Minimise moisture content in the dumps.<br>• Establish an appropriate borehole monitoring network.<br>• Ensure that good housekeeping rules are applied, and emergency spill clean-up procedures and equipment are in place.<br>• Draw-up and strictly enforce procedures for the storage, handling, and transport of different waste materials.<br>• Place oil traps under stationary machinery, only re-fuel machines at fuelling station, construct structures to trap fuel spills at fuelling station, immediately clean oil and fuel spills and dispose contaminated material (soil, etc.) at licensed sites only.<br>• Ensure that facilities are well maintained good housekeeping rules are applied. | Management of erosion | Implementation of the mitigation measures will ensure that the quality of groundwater within the site will comply with the target DWS target water quality objective and will be of quality that can still be used by surrounding groundwater users. | Impact avoided |
| | Negative impacts on local communities and livestock and safety due to the presence of pits used for bulk sampling | Social | Operation | • Ensure adequate access control to the project site<br>• Bulk sampling pits shall be located as far from private property as is possible to minimise damage to infrastructure; | Control and management of access to trenches/pits | Implementing mitigation measures will reduce conflict with property owners around the project site | No complaints from landowners due to prospecting activities. Should there be conflicts, these must be resolved<br>No loss of livestock and injuries or loss of human life |
| | Potential groundwater contamination from poor waste and sanitation management | Groundwater | Operation | • Management and maintenance of sewage management infrastructure.<br>• Supply chemical toilets where no permanent infrastructure exists | Groundwater quality monitoring | Implementation of the mitigation measures will ensure that the quality of groundwater within the site will comply with the target DWS target water quality objective and will be of quality that can still be used by surrounding groundwater users | Groundwater Quality Standards |
| | Potential groundwater contamination caused by spillages and accidents | | | • Good housekeeping, and adherence to good health and safety practices | | | |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| | Potential groundwater contamination caused by hydrocarbon chemicals storage | | | • Oil spill kits in case of spills of hydrocarbon chemical | | | |
| | Impact of the Removal and Alteration of Natural Water Courses on Catchment Response: The proposed shallow pits have not yet been determined; however, it will certainly cover a significant portion of the proposed project area. Inevitably, certain existing non perennial water courses that collect and convey surface water runoff to drainage lines and wetlands would be removed or altered. | Hydrology and surface water | Operation | • Where prospecting infrastructure, such as roads, are required across natural water courses, new stormwater infrastructure, such as pipes and culverts could replace the hydraulic function currently offered by the natural water courses.<br>• This infrastructure should be designed for both hydraulic performance and environmental functionality. A thorough assessment of the suitability of the new stormwater infrastructure must be made at the preliminary design stage.<br>• The water quality of the drainage lines and wetlands adjacent to the project site should be monitored monthly as described in the operational management plan. | Management and monitoring of water quality<br>Management and maintenance of infrastructure | Implementation of mitigation measures will ensure that the prospecting activities do not have detrimental impacts on the surface water resources and wetlands. | Compliance with NNWA and GNR704 |
| | Positive Impact of Reduced Peak Runoff and Discharge Volumes on Water Courses: The proposed prospecting development would require construction of Prospecting and bulk sampling with pits and trenches; Ablution facility; Access roads; Diesel storage; Office site; Plant site; Slimes dam; Office Area; and Vehicle parking area. Being classified as “dirty,” rain falling on this infrastructure would be captured and contained. Consequently, the quantum of surface water runoff would reduce. | Hydrology and surface water | Operation | • As the impact is deemed Positive, no mitigating measures were proposed. | N/A | N/A | N/A |
| | Loss/ change of current land use, including reduced area for run-off;<br>Soil disturbance due to excavation activities at quarry location as well as in surrounding soils.<br>Modification of natural soil hydrological regime. | Downstream water resources | Operation | • Store all chemicals used on the site in bunded areas.<br>• A stormwater management plan must be developed and implemented,<br>• Dirty and clean water must be kept separate and where possible, clean water must be directed away from project area to downstream water resources.<br>• Clean up spillages immediately and dispose of contaminated materials to a permitted waste site.<br>• Maintain bunded areas.<br>• Ensure stormwater management system complies to GNRRF704;<br>• Store all chemicals used on the site in bunded areas. | Monitor and manage water quality impacts | Implementation of mitigation measures will ensure that the prospecting activities do not have detrimental impacts on the soils, groundwater, and surface water resources. | Rehabilitation standards |
| Vehicles and use of equipment/ machinery | Water resource contamination from hydrocarbon spills from vehicles and equipment | Downstream water resources | Operation | | | Implementation of mitigation measures will ensure that the prospecting activities do not have detrimental impacts on the soils, groundwater, and surface water resources. | Water Quality Standards |
| Operational activities | Establishment and spread of alien invasive species | Flora | Operation | • Monitoring of relocation success of rescued and relocated floral SCC (if any) should take place during the operational phase;<br>• Harvesting of protected floral species by prospecting and operational personnel should be strictly prohibited.<br>• The operational footprint must be kept as small as possible in order to minimise impact on the surrounding environment; | Management and monitoring of vegetation clearance | The implementation of mitigation measures will ensure that the prospecting activities do not have detrimental impact on the area’s flora, in particular indigenous species and species that are of conservation importance. | Alien Invasive Plant Species Eradication |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| | | | | • Edge effect control needs to be implemented within disturbed areas;<br>• Erosion berms and hessian sheets are to be used in areas where soils are susceptible to high levels of erosion;<br>• No vehicles are allowed to indiscriminately drive through sensitive natural areas;<br>• Upon completion of construction activities and decommissioning of temporary access road, all impacted and disturbed areas should be ripped, re-profiled and reseeded with an Indigenous veldgrass mixture that will assist to stabilise soils as soon as possible;<br>• During the operational phases of the project, erosion berms may be installed to prevent gully formation;<br>• The following points should serve to guide the placement of erosion berms:<br>o Where the track has a slope of less than 2%, berms every 50m should be installed;<br>o Where the track slopes between 2% and 10%, berms every 25 m should be installed;<br>o Where the track slopes between 10% and 15%, berms every 20 m should be installed;<br>o Where the track has a slope greater than 15%, berms every 10 m should be installed.<br>*Minimisation*<br>• An AIPS control programme must be developed and implemented during all phases of the proposed project;<br>• AIS control should be undertaken in both the project site, and natural habitat and rehabilitated areas immediately adjacent to the site;<br>• It is recommended that the programme include:<br>o A combined approach using both chemical and mechanical control methods;<br>o Periodic follow-up treatments, informed by regular monitoring; and<br>o Monitoring should take place in disturbed areas, as well as adjacent undisturbed areas.<br>*Rehabilitation*<br>• Rehabilitate cultivated land in the project site that is not used for crop production;<br>• Rehabilitate all sites that are disturbed by construction phase activities, as per the rehabilitation programme; and<br>• Rehabilitate all disturbed footprints during the closure and rehabilitation phases, as per the rehabilitation programme. | | | |
| Movement of vehicles | Mortality and disturbance of fauna | Fauna | Operation | <u>Death/injury during vegetation clearing and earth works</u><br>• An Environmental Compliance Officer (ECO) should be on-site during vegetation clearing to monitor for, and manage, any wildlife-human interactions. The ECO should be trained in inter alia, snake handling; and<br>• As appropriate, fences should be erected to prevent fauna gaining access to construction and operational areas, such as open trenches and voids.<br><u>Vehicle-wildlife collisions</u> | Management and enforcement of road speed limits | Mitigation measures will ensure that the animal life within in the project is not affected by the proposed project. | Impact avoided |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| | | | | • Road signage indicating the potential presence and movement of wildlife should be installed within the construction footprints and along public roads.<br><u>Hunting, snaring, and poisoning</u><br>• The handling, poisoning, and killing of on-site fauna by construction workers and contractors must be strictly prohibited; and<br>• Employees and contractors should be made aware of the presence of, and rules regarding, fauna through suitable induction training and on-site signage.<br><u>Noise, vibrations, and lights (sensory disturbances)</u><br>• General noise abatement equipment should be fitted to machinery and vehicles;<br>• As required, noise shields, including earth berms, should be constructed around sites of noise origin;<br>• Dust suppression using water bowsers/sprayers should be undertaken on all sites/facilities where dust entrainment occurs; and<br>• Plan the lighting requirements of facilities to ensure that lighting meets the need to keep the site secure and safe, without resulting in excessive illumination. Possible options include:<br>o Zoning of areas of high and low lighting requirements;<br>o Movement activated lights as opposed to permanent lights; and<br>• Reducing height and angle of lights. | | | |
| Use of heavy machinery | Changes in surface water quality due to contamination from heavy construction equipment | Water courses | Operation | • Areas to be cleared should be clearly demarcated to prevent unnecessary clearing outside of these sites as to avoid approaching too close to the rivers.<br>• See further mitigation measures detailed in the terrestrial ecology report.<br>• Avoid the accumulation of non-perennial bodies of water such as flooded borrow pits / drainage canals and floodplain depressions where possible.<br>• Temla 13 should implement a monthly monitoring programme for surface water and the data used for comparative analysis between the upstream and downstream sites.<br>• Information from this monitoring can be used to quickly implement management actions should there be a significant change in water quality directly downstream of the project area.<br>• Contain and/or avoid potential spills which could make their way to adjacent water resources.<br>• Maintain service roads to avoid erosion and excessive dust formation; | Surface water quality monitoring | Implementation of mitigation measures will enable the project to comply with the requirements of the NWA | Impact avoided |
| Operational phase activities | Loss of ecological communities and surface water quality issues due to increased sedimentation and the potential mobilisation of pollutants | Soils<br>Flora<br>Surface water | Operation | • Aim for majority of the earth mobilisation activities associated with the prospecting activities to be conducted during the dry season, so as to limit the intensity of impact, particularly in terms of runoff of sediments;<br>• Implement low impact construction techniques to minimise the impact on the surrounding and | Monitoring of vegetation on site | Implementation of mitigation measures will assist with avoiding loss of and maintaining the biodiversity within the project area and will enable the project to comply with the requirements of the NWA | Impact avoided<br>Impacts on flora, especially SCC is reduced or avoided |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
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| | | | | downstream river systems;<br>• Vegetation clearing should be restricted to the proposed development footprints only, with no clearing permitted outside of these areas;<br>• Areas to be cleared should be clearly demarcated to prevent unnecessary clearing outside of these sites as to avoid approaching too close to the adjacent rivers.<br>• See further mitigation measures detailed in the terrestrial ecology report. | | | |
| Operational phase noise | Noise nuisance | Noise | Operation | *Materials handling activities:*<br>• The drop height policy should be maintained onsite. All equipment operators should be trained in the policy such that drop height reduction is implemented onsite; and<br>• Wind speed reduction through sheltering (where possible).<br>*Vehicle noise during ore haulage:*<br>• Rigorous speed control to reduce the noise from vehicle traffic. It is recommended that a maximum speed of 20 km/h to be set on all unpaved roads and 40km/h on paved roads;<br>• Reduction in unnecessary traffic volumes by developing plans to optimise vehicle usage and movement; and<br>• Encouraging the receipt of materials during non-peak traffic hours to avoid traffic build-up and associated noise.<br>*Heavy vehicle/machinery noise:*<br>• Ensuring that equipment is well maintained and fitted with the correct and appropriate noise abatement measures;<br>• All vehicles and other equipment should be maintained and serviced regularly to ensure that the noise levels are reduced; and<br>• Vehicles should not be allowed to idle for more than 5 minutes when not in use. | Management and monitoring noise levels | The mitigation measures ensure that the noise levels from blasting activities will be managed, and measures will be taken to ensure that noise levels are below the National Noise Control Regulations, SANS 10103:2008 Guidelines and will ensure that the noise levels emanating from the project will not have detrimental effects on the project workers and surrounding communities/landowners. | Impact Avoided |
| Operational phase activities | Employment | Socio- Economic | Operation | • Communities within the vicinity of the project should be given special consideration in terms of the benefits arising from the project because they will be the most affected by the project. It is recommended that the following mitigation measures be implemented:<br>• A local skills database must be developed and updated regularly. The skills database should be used for recruitment purposes to minimise the probability of nepotism or corruption during the recruitment process;<br>• A monitoring system should be put in place to ensure that Temla 13's recruitment policy is adhered to. | Management of the implementation of Temla 13 recruitment policy | Implementing the mitigation measures will enhance the employment and benefits accrued to the local communities | Impact enhanced |
| Operational phase activities | Impact of Increased Sediment Yield on Surface Water Quality on the erosion potential of the local soils, it is likely that the construction and operational phases of the proposed development would cause an increase in erosion. Thus, an increase in sediment | Surface water and hydrology | Operational | • Pollution control dams should be constructed to contain surface water runoff from all dirty areas, such as waste rock stockpiles. Dirty runoff should be directed toward the processing plant area through a well-designed system of berms and channels.<br>• The runoff from bare areas, such as haul roads, must be collected, and conveyed by adequate | Management and monitoring of water quality<br>Stormwater Management | Implementation of mitigation measures will reduce impacts on surface water quality and conflict with downstream users | Impact reduced |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
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| | deposition could be expected at the drainage lines and wetlands. To limit the environmental impact on faunal and floral communities, sediment yield must be reduced as far as possible. Sediment load is measured in terms of Total Suspended Solids (TSS), but through the effective design and deliberate implementation of BMP "treatment trains, its impact can be mitigated | | | side drains. This water, which would be high in TSS content, should be attenuated and retained sufficiently to allow sediment to settle prior to the discharge of the sufficiently clean supernatant;<br>• Dust mitigation should be implemented.<br>• The quality of runoff in watercourses during the rainy season should be monitored and corrective actions taken as appropriate.<br>• During the decommissioning phase, all unnecessary bare surfaces and developed zones should be removed and as far as is possible, restored to their natural state | | | |
| Operational phase activities | Impact of Increased Pollutant Load on Surface Water Quality | Surface water and hydrology | Operational | • A thorough, regular inspection and maintenance regime should be implemented for the ablution area and facilities;<br>• Pump stations should be inspected, serviced, and cleaned monthly, and manholes and underground pipes inspected and cleaned every six months;<br>• An emergency response unit should be established to undertake urgent maintenance and repair work after hours;<br>• Surface water runoff from the dirty areas (e.g., waste rock stockpiles, tailings dam) must be captured and wherever possible, reused in the prospecting process. Pollution control dams should be deployed. Dirty runoff should be directed towards this process area through a well-designed system of berms and channels;<br>• All areas where hydrocarbons, such as oils and petroleum fuels are handled (i.e., workshops should be bunded and strictly controlled to minimize the risk of accidental spillages;<br>• Water quality of runoff into the drainage lines and wetlands should be monitored monthly and corrective actions taken as appropriate. | Management and monitoring of water quality<br>Stormwater Management | Implementation of mitigation measures will reduce impacts on surface water quality and conflict with downstream users | Impact reduced |
| Operational phase activities | Health and safety risk | Socio- Economic | Operation | • Temla 13 must adhere to all requirements contained in the Occupational Health and Safety Act (Act 85 of 1993) and the Mine Health and Safety Act (Act 29 of 1996).<br>• The project will be maintained during its lifetime to minimise the risk of project personnel being injured because of failed machinery, and so forth.<br>• Rigorous operational health and safety programmes should be implemented. | Manage through health and safety policies and training | Implementing mitigation measures will ensure recruitment of locals as per the requirements of the recruitment policies for the proposed project and BBBEE Act and will minimise conflicts with surrounding landowners and communities. | Impact avoided |
| Operational phase | Possibility of unearthing unknown graves or other buried cultural/archaeological items | Archaeology and cultural heritage | Operation | • Chance find procedures will be implemented:<br>• All work in the immediate vicinity of the find will cease;<br>• The area will be demarcated with barrier tape or other highly visible means;<br>  ○ SAHRA will be notified immediately;<br>  ○ An archaeologist accredited with the Association for Southern African Professional Archaeologists (ASAPA) will be commissioned to assess the find and determine appropriate mitigation measures, which may include obtaining the necessary | Management of access to heritage resources and sites | Mitigation measures will ensure compliance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999) and recommendations from the specialist. The mitigation measures will ensure that the construction activities do not have detrimental impacts on heritage sites | Impact avoided |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| | | | | authorisation from SAHRA to undertake the mitigation measures; and<br>○ Access to the find by unqualified persons will be prevented until the assessment and mitigation processes have been completed. | | | |
| Movement of construction vehicles | Risk of vehicle collision | Traffic | Operation | • Indicate areas where heavy vehicles will be expected with adequate signage. | Speed control and limitation of the times when construction vehicles may be on the roads<br>Manage through road upgrades where required | Implementing mitigation measure will ensure road safety along the public roads and onsite and to increase awareness of slow-moving vehicles and will reduce conflict with other road users. | Impact avoided |
| | Risk of pedestrian accidents | Traffic | Operation | • Clearly indicate pedestrian crossings.<br>• Educate drivers on potential areas of high pedestrian activity.<br>• Educate community on dangers of construction vehicles new to their area. | | | |
| | Health and Safety Risk | Roads and Traffic | Operation | • The deterioration of public roads over time must be monitored, and a maintenance plan must be negotiated with the National Road Administration, with specific mention of the Monitoring and Planning departments that should be consulted. | Manage through health and safety policies and training | Implementing mitigation measure will ensure road safety along the public roads and onsite and to increase awareness of slow-moving vehicles and will reduce conflict with other road users. | Impact avoided |
| | Drilling has potential to affect the day-to-day operations by affected landowners | Socio Economic | Operation | • Random and regular alcohol and drug testing shall be conducted on all personnel responsible for operating machinery and driving construction vehicles to ensure the safety of the public;<br>• Drill sites shall be kept to a minimum;<br>• Landowners shall be informed of the exact location of the drill sites and shall be privy to the drilling programme, indicating the days on which each site will be drilled; and<br>• The time spent at each drill site shall be kept to a minimum.<br>• Security and safety should be emphasized;<br>• No construction workers shall be allowed to access private properties without the owner's knowledge and consent;<br>• Access to private property and areas outside the designated operation areas shall be strictly prohibited. | Manage through communication and access control | Implementing mitigation measures will reduce conflict with property owners around the project site | Maintain a 100% crime free area within the control of the prospecting<br>No complaints from landowners due to prospecting activities. Should there be conflicts, these must be resolved |
| | As a result of drilling activities during operation, potential damage to adjacent landowner's/occupiers' infrastructure | Socio Economic | Operation | • Drill sites shall be located as far from private property as is possible to minimise damage to infrastructure;<br>• Should private property be damaged due to operation activities, property owners shall be appropriately compensated. | Manage through proper planning of drill site locations | Implementing mitigation measures will reduce conflict with property owners around the project site | No complaints from landowners due to prospecting activities. Should there be conflicts, these must be resolved |
| | As a result of drilling, there is potential for the occurrence of subsidence, impacting on the safety surface land dwellers and users. | | | | | | |
| | The prospecting operations will require the drilling of boreholes, which my result in the drawdown, which may affect the yield to the surrounding groundwater users. Material used for backfilling boreholes may leach pollutants, which will result in the contamination of surrounding groundwater regime. This may spread | Groundwater and Soils | Operation | • Ensure that the landowners' borehole yields are monitored during the drilling operation.<br>• Should it be proven that the operation is indeed affecting the quantity and quality of groundwater available to users and surrounding water resources, the affected parties must be compensated. | Rehabilitation of affected areas and control using bunds | Implementing mitigation measures will minimise impacts on soils and groundwater quality.<br>Implementing mitigation measures will also reduce conflict with surrounding groundwater users. | No soil contamination as a result of hydrocarbon spillages<br>Rehabilitation and disposal of contaminated soils conducted in terms of the NEM:WA |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
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| | beyond the backfilling site via plume migration. | | | | | | |
| | Drilling operations my result in the generation of surface water runoff contaminated with drill muds and cuttings, should spillage occur.<br>The sedimentation and possible contamination with carbonaceous material will have negative impacts on the water quality due to increase turbidity and an increase in acidity of the water in the streams. | Surface Water and wetlands | Operation | • No prospecting operations will be undertaken within 100 metres from the nearby steams and 500 meters from wetland areas without authorisation from the DWS;<br>• Sumps will be excavated for the collection mud and excess water from the drilling sites;<br>• The sumps will be sized such that they will be able to contain the water and mud that will be generated during the prospecting operation;<br>• Storm water generated around the drilling site will be diverted away to the clean water environment;<br>• No concrete mixing and vehicle maintenance will be allowed on site.<br>• All hydrocarbons will be stored on protected storage areas away from the streams. | Control through management and monitoring of surface runoff | Implementing mitigation will minimise potential water quality issues<br>Implementing the mitigation measures will also reduce conflict with downstream water users | Retain topsoil integrity for the reuse in rehabilitation.<br>No dirty runoff/stormwater entering water courses.<br>Comply with GNR704<br>The NWA: No activities within 100 m of watercourses without consent from the DWS.<br>No soil contamination as a result of hydrocarbon spillages<br>Rehabilitation and disposal of contaminated soils conducted in terms of the NEM:WA |
| | Impact of Reduction in Mean Annual Runoff on Downstream Surface Water Resources | Hydrology and surface water Downstream water resources | Operation | • Where possible, artificial replenishment which is needed due to the not so good water quality (muddy) at the drainage lines and wetlands must be explored and implemented. | Monitor and manage water quality impacts | Implementation of mitigation measures will ensure that the prospecting activities do not have detrimental impacts on the surface water resources and downstream users. | Impact minimised |
| | Uncontrolled access to wetland areas may have an impact on the aquatic ecological habitat, ecological functioning, and structure. | Wetlands and Aquatic Ecosystems | Operation | • No drilling shall be allowed within wetlands and associated 32m buffer areas<br>• Adequate stormwater management must be incorporated into the design of the project in order to prevent erosion and the associated sedimentation of the aquatic system;<br>• Riparian vegetation bordering on drainage lines, wetlands and rivers will be considered environmentally sensitive and impacts on these habitats should be avoided.<br>• No releases of any substances that could be toxic to fauna or faunal habitats within the channels or any watercourses is permitted.<br>• Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed, and the affected area rehabilitated immediately.<br>• Education of workers is key to establishing good pollution prevention practices. Training programs must provide information on material handling and spill prevention and response, to better prepare employees in case of an emergency.<br>• Signs should also be placed at appropriate locations to remind workers of good housekeeping practices including litter and pollution control.<br>• The proper storage and handling of hazardous substances (hydrocarbons and chemicals) needs to be ensured. All employees handling fuels and other hazardous materials are to be | Control through the enforcement s of the 32m wetland buffer<br>Manage through the implementation of the stormwater management plan | Implementing mitigation measures will reduce impacts on wetlands and aquatic ecosystems | No activities shall be allowed within the wetlands and associated 32m buffer areas<br>NWA: No activities shall be permitted within 500 m of wetland areas without prior approval from the DWS<br>Comply with requirements of the NWA |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| | | | | properly trained. Storage containers must be regularly inspected so as to prevent leaks.<br>• All contractors and employees should undergo induction which is to include a component of environmental awareness.<br>• No prospecting activities and access to wetlands and associated 32m buffer is permitted.<br>• No drilling activities shall be allowed within 500 m of wetland areas without consent from the DWS;<br>• No vehicles may be allowed to indiscriminately drive through the wetland areas or within the active stream channels;<br>• All disturbed areas shall be re-vegetated with indigenous species;<br>• All construction materials shall be kept out of the wetland areas;<br>• Implement a programme for the clearing/eradication of alien species including long term control of such species;<br>• Wetland monitoring and biomonitoring must take place bi-annually. | | | |
| | The drill rigs and towers used during the drilling operation phase will be visible from nearby locations and will have visual impact on the local communities in close proximity to the prospecting area. | Visual | Operation | • Ensure that the time period used for the drill rigs is optimised to ensure that the drill rigs are moved from one site to another over short periods<br>• Materials transported on public roads must be covered.<br>• Raise the view range for parts where the digger will operate. Visually looking at a mound with trees will mitigate any form of visual impact on the site. It is a flat site so from a specific range the project should not be visible to its immediate surroundings.<br>• Create buffer zones in the affected area. Rehabilitate the buffers, plant trees, and create a visual barrier between the affected area and the prospecting operation. | Strategic location of rigs and towers to areas where there may be some tree cover, as far as practicable | Implementation of mitigation measures will reduce visual impacts | No removal of vegetation outside de of demarcated area to ensure as much vegetation cover for the rigs, as possible<br>Make use of rigs that have earthy cover to minimise the visual impact |
| Storage of chemicals and fuel | Spills of chemicals (e.g., hydrocarbon).<br>Soil contamination on adjacent land potentially occurring due to inappropriate waste disposal and potential oil and diesel leakages from vehicles and machinery | Soil, Land Use and Land Capability<br>Groundwater<br>Surface Water | Operation | • Accidental spills (concrete, chemicals, process water, hydrocarbons, waste) need to be reported as soon as practical so that effective remediation and clean-up strategies and procedures can be implemented.<br>• Where possible, soil that is contaminated by fuel or oil spills will be collected to be treated at a pre-determined and dedicated location, or will be treated in situ, using sand, soil as absorption medium.<br>• Practice good housekeeping in chemical storage areas and ensure that storage areas are bunded.<br>• On surface bulk storage of hydrocarbons must be situated in a dedicated area which will include a bund or a drain where necessary to contain any spillages during the use, loading and off-loading of the material.<br>• Bunded areas shall contain 110% of the stored volume. | Management and monitoring of spills<br>Monitoring and management of the integrity of infrastructure | Implementation of mitigation measures will ensure that the prospecting activities do not have detrimental impacts on the soils, land use and land capability. | Impact avoided<br>Comply with the requirements of the NEM: WA and NWA |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| | | | | • Bund areas must be impermeable.<br>• Bund area must have a facility such as a valve/sump to drain or remove clean stormwater.<br>• Place oil traps under stationary machinery, only re-fuel machines at fueling station, construct structures to trap fuel spills at fueling station, immediately clean oil and fuel spills and dispose contaminated material (soil, etc.) at licensed sites only.<br>• Draw-up and strictly enforce procedures for the storage, handling, and transport of different hazardous materials.<br>• Ensure vehicles and equipment are in good working order and drivers and operators are properly trained.<br>• Contaminated water shall be pumped into a container for removal by an approved service provider;<br>• Regular inspections shall be carried out to ensure the integrity of the bundwalls;<br>• All preventative servicing of earth moving equipment and construction vehicles shall conducted off site;<br>• Runoff from the chemical storage area shall be contained; | | | |

**Table 35-3: Impact Management During the Decommissioning and Closure Phase**

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| Spills of chemicals (e.g., hydrocarbon).<br>Soil contamination on adjacent land potentially occurring due to inappropriate waste disposal and potential oil and diesel leakages from vehicles and machinery | Spillage of chemical solutions during the dismantling of plant equipment, and infrastructure which were in contact with chemicals solution may contaminate the soils; Spillage of diesel, oils, and greases from the dismantled plant equipment, resulting in hydrocarbon contamination of exposed soils | Soil, Land Use and Land Capability | Decommissioning and closure | • Ensure proper handling of hazardous chemicals and materials (e.g., fuel, oil, cement, concrete, reagents, etc.) as per their corresponding Material Safety Data Sheets (MSDS);<br>• Dismantling of plant equipment and machinery should be carried out in designated appropriate facilities fitted with spillage containment, floors, and sumps to capture any fugitive oils and greases. Develop detailed procedures for spills containment and soils clean up.<br>• Conduct soil assessment to determine post decommissioning/ closure soil quality on rehabilitated infrastructural footprint.<br>• Where possible, re-use stockpiled soil within as short a period as possible.<br>• Use appropriate soil handling machinery, preferably avoiding heavy earth moving equipment used for decommissioning activities to minimise compaction.<br>• Limit vehicle traversing on both stockpiles and rehabilitated areas as far as possible.<br>• Prepare rehabilitated areas properly and monitor regularly. | Management and monitoring of spills | Rehabilitated areas will be maintained to comply with the closure objectives. | Rehabilitation Standards<br>End use objectives |
| Removal of redundant infrastructure | Soil compaction in areas where active heavy machinery will be mobilised for the shaping of the final landform; and Loss of soil organic matter due to increased aeration (caused by soil disturbance) and subsequent organic matter decomposition. | Soil, Land Use and Land Capability | Decommissioning and closure | | Management and monitoring of soil stockpiles | Rehabilitated areas will be maintained to comply with the closure objectives. | Rehabilitation Standards<br>End use objectives |
| Borehole capping | The removal of the campsite equipment and the rehabilitation of the drilling sites and associated access infrastructure will result in the affected soil and land use being restored. This will also result in the resumption of the use of the land since the infrastructure would have been removed. | Soils, Land Capability and Land Use | Decommissioning and Closure | | Management and monitoring of soil stockpiles | Rehabilitated areas will be maintained to comply with the closure objectives. | No removal of vegetation outside of demarcated areas.<br>Ensure successful rehabilitation of contaminated soils<br>Rehabilitation of land to a state it was before prospecting activities |
| Grading of project site to ensure long-term drainage conditions on site | Soil handling to convey soil from topsoil stockpile to project site for surface rehabilitation activities, may result in degradation of soil quality due to soil disturbance.<br>Contamination of soil by handling of soil with contaminated earth moving Machinery (machinery previously used for handling project waste such as waste rock).<br>Insufficient soil volumes to meet end land use soil requirements. | Soil, Land Use and Land Capability | Decommissioning and closure | | Management and monitoring of soil stockpiles | Rehabilitated areas will be maintained to comply with the closure objectives. | Rehabilitation Standards<br>End use objectives |
| Destruction of all surface infrastructure;<br>Backfill and closure of the prospecting areas trenches/pits. | Potential groundwater Contamination resulting from seepage from waste rock dump. | Groundwater | Decommissioning and closure | • Minimise footprint of waste rock dump by backfilling as much waste rock into trenches/its and cap remaining waste rock with soil and vegetate | Groundwater monitoring | Rehabilitated areas will be maintained to comply with the closure objectives. | Rehabilitation Standards<br>End use objectives |
| | Potential groundwater contamination resulting from remaining surface infrastructure | Groundwater | Decommissioning and closure | • Remove buildings for which alternative post-prospecting use is identified and rehabilitate site to pre- agreed conditions | Groundwater monitoring | Rehabilitated areas will be maintained to comply with the closure objectives. | Rehabilitation Standards<br>End use objectives |
| | Potential groundwater contamination from poor waste and sanitation management | Groundwater | Decommissioning and closure | • Remove infrastructure unless post-prospecting use is identified and rehabilitate to pre-agreed conditions. | Groundwater monitoring | Rehabilitated areas will be maintained to comply with the closure objectives. | Rehabilitation Standards<br>End use objectives |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| | Potential groundwater contamination caused by spillages and accidents | Groundwater | Decommissioning and closure | • Good housekeeping, and adherence to good health and safety practices during closure activities | Groundwater monitoring | Rehabilitated areas will be maintained to comply with the closure objectives. | Rehabilitation Standards<br>End use objectives |
| Removal of redundant infrastructure | Spillage of chemical solutions during the dismantling of plant equipment, pipelines or pumps which were in contact with chemicals solution may contaminate the soils; Spillage of diesel, oils and greases from the dismantled plant equipment, resulting in hydrocarbon contamination of exposed soils. | Downstream water resources | Decommissioning and closure | • Ensure that all contaminated areas are adequately removed and disposed of to a permitted waste site.<br>• Clean up spillages immediately and dispose of contaminated materials to a permitted waste site. | Management of spills<br>Water quality monitoring | The surface water leaving the rehabilitation site will comply with the DWS target water quality parameters. | Rehabilitation Standards<br>End use objectives |
| Grading of project site to ensure long-term drainage conditions on site | Soil compaction in areas where active heavy machinery will be mobilised for the shaping of the final landform; and Loss of soil organic matter due to increased aeration (caused by soil disturbance) and subsequent organic matter decomposition. | Downstream water resources | Decommissioning and closure | • Re-use stockpiled soil within as short a period as possible.<br>• Use appropriate soil handling machinery to Minimise compaction<br>• Limit vehicles traversing on both stockpiles and rehabilitated areas as far as possible.<br>• Prepare rehabilitated areas properly and monitor regularly. | Water quality monitoring | The surface water leaving the rehabilitation site will comply with the DWS target water quality parameters. | Rehabilitation Standards<br>End use objectives |
| Soil placement and revegetation of project site | Soil handling to convey soil from topsoil stockpile to project site for surface rehabilitation activities may result in erosion and sedimentation.<br>Contamination of soil by handling of soil with contaminated earth moving machinery (machinery previously used for handling project waste such as waste rock). | Downstream water resources, | Decommissioning and closure | • Revegetate as quickly as possible to limit erosion and sedimentation in downstream water resources. | Water quality monitoring | Rehabilitated areas will be maintained to comply with the closure objectives. | Rehabilitation Standards<br>End use objectives |
| Vegetation clearing and earth works | Establishment and spread of alien invasive species | Terrestrial ecology | Decommissioning and closure | *Minimisation*<br>• An Alien Invasive Species (AIS) control programme must be developed and implemented during all phases of the proposed project;<br>• AIS control should be undertaken in both the project site, and natural habitat and rehabilitated areas immediately adjacent to the site;<br>• It is recommended that the programme include:<br>o A combined approach using both chemical and mechanical control methods;<br>o Periodic follow-up treatments, informed by regular monitoring; and<br>o Monitoring should take place in disturbed areas, as well as adjacent undisturbed areas.<br>*Rehabilitation*<br>• Rehabilitate cultivated land in the project site that is not used for crop production;<br>• Rehabilitate all sites that are disturbed by construction phase activities, as per the rehabilitation programme; and | Management of alien invasive plant species<br>Monitoring of rehabilitation areas<br>Rehabilitation of affected areas | Rehabilitated areas will be maintained to comply with the closure objectives. | Rehabilitation Standards<br>End use objectives |

| Activity | Potential Impact | Aspects Affected | Project Phase | Mitigation and Management Measures | Mitigation Type | Compliance with Standards | Standard to be achieved |
|---|---|---|---|---|---|---|---|
| | | | | • Rehabilitate all disturbed footprints during the closure and rehabilitation phases, as per the rehabilitation programme. | | | |
| Decommissioning and closure phase activities | Permanent alteration of site topographical and visual character of the area | Visual | Decommissioning and closure | • Dismantle and remove all visible surface-built infrastructure during decommissioning;<br>• Re-shape all footprint areas to be as natural in appearance as possible and actively revegetate using locally occurring grass species;<br>• Stabilise and backfill and contour to ensure it is free draining; and<br>• Establish a vigorous and self-sustaining vegetation cover using locally occurring grass species; | Management of visual impacts<br>Monitoring of rehabilitated areas | Rehabilitated areas will be maintained to comply with the closure objectives. | Rehabilitation Standards<br>End use objectives |
| Downscaling and retrenchment | Reduced regional economic development | Socio- economic | Decommissioning and closure | • Engage local and regional government with respect to the decommissioning phase. | | | |
| Downscaling and retrenchment | Reduced community investment | Socio- economic | Decommissioning and closure | • Temla 13 will develop exit strategies for all its community development initiatives. | | | |
| Closure phase | The closure and rehabilitation phase should have no impact on any identified cultural and heritage resources | Archaeology and cultural heritage resources | Decommissioning and closure | • It is not expected that any mitigation measures will be required. | | | |
| Movement of construction vehicles | Risk of vehicle collision | Traffic | Decommissioning and closure | • Indicate areas where heavy vehicles will be expected with adequate signage. | | | |
| Movement of construction vehicles | Risk of pedestrian accidents | Traffic | Decommissioning and closure | • Clearly indicate pedestrian crossings.<br>• Educate drivers on potential areas of high pedestrian activity. Educate community on dangers of construction vehicles new to their area. | | | |
| Movement of construction vehicles | Degradation of Public Roads | Traffic | Decommissioning and closure | • The deterioration over time must be monitored and a maintenance plan must be negotiated with the Provincial Authority. | | | |

# 36 Impact Management Actions

**Table 36-1: Impact Management Actions for the Construction Phase**

| Activity | Potential Impact | Mitigation Type | Time Period for Implementation | Compliance with Standards |
|---|---|---|---|---|
| Project Kick Off and Planning | | Control potential deviations from the approved EMPr. | Pre-Construction | Comply with management measures stipulated in the EMPr. |
| Project Kick Off and Planning | | Control potential deviations from the approved EMPr. | Pre-Construction, Construction and Decommissioning | Ensure all construction staff is familiar with the Environmental Awareness Plan. |
| Project Kick Off and Planning | | Control potential deviations from the approved EMPr. | Pre-Construction | Ensure that all staff is familiar with the emergency procedure and plan. |
| Data Collection and Assessment (Desktop Study) | None | Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study. | Pre-Construction | Comply with management measures stipulated in the EMPr. |
| Geological Mapping (Desktop Study) | None | Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study. | Pre-Construction | Comply with management measures stipulated in the EMPr. |
| Planning for Drilling Surveys (Desktop Study) | None | Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study. | Pre-Construction | Comply with management measures stipulated in the EMPr. |
| Site Establishment and site clearance for the construction of infrastructure:<br>• Prospecting areas<br>• Slimes Dam<br>• Waste Rock Dump Area<br>• Access Roads<br>• Chemical and diesel storage areas<br>• Temporary Workshop Facilities,<br>• Storage facilities<br>• Recovery plant site<br>• trenches/pits<br>• Topsoil stockpile areas | Groundwater and Surface water contamination | Control through management and monitoring of spillages. Where spillages occur, the soil must be stripped and disposed of as stipulated in the EMPr. | Pre-Construction and Construction | Comply with NWA<br>Comply with WUL conditions<br>Comply with GNR704<br>Comply with NEM: WA |
| | Wetland destruction and loss of wetland habitat and hydrological functions | Prohibit access to wetland areas and within the 32 m ZOI determined by the specialist.<br>No activities within 500m of wetlands without an authorisation from the DWS | Pre-Construction and Construction | Comply with NWA<br>Comply with WUL conditions<br>Implement and comply with 32m buffer no-go area as recommended by wetland specialist |
| | Contamination of surface water resources | Monitoring through rehabilitation and management of spills<br>Rehabilitate contaminated areas<br>Implement the stormwater management plan to be compiled for the project | Pre-Construction and Construction | Comply with NWA<br>Comply with WUL conditions<br>Comply with GNR704<br>Comply with NEM: WA |
| | Loss of Species of Conservation Concern | Rehabilitation of areas cleared of vegetation.<br>Control of alien invasive plant species | Pre-Construction and Construction | The implementation of mitigation measures will ensure that the establishment of the construction site and associated infrastructure/equipment do not have detrimental impact on the area's flora, in particular indigenous species and species that are of conservation importance. |
| | Migration of animal life due to disturbance caused proposed project: | Relocation of affected species of conservation importance<br>Management of site activities | Pre-Construction and Construction | Mitigation measures will ensure that the animal life within in the project is not affected by the proposed project. |
| | Mortality and disturbance of fauna | Management of site activities | Pre-Construction and Construction | Mitigation measures will ensure that the animal life within in the project is not affected by the proposed project. |
| | Loss of soils, erosion of the soils and impacts on landowner's livelihood | Retain topsoil integrity for the reuse in rehabilitation<br>Vegetation clearance shall be kept to a minimum. No clearance of | Pre-Construction and Construction | Implementation of mitigation measures will ensure that the activities in the development of the construction sites and associated infrastructure do not have detrimental impacts on the soils, land use and land capability. |

| Activity | Potential Impact | Mitigation Type | Time Period for Implementation | Compliance with Standards |
|---|---|---|---|---|
| | | vegetation outside demarcated areas | | |
| Transportation of material and movement of vehicles and machinery on construction areas | Possible increase in nuisance dust and carbon emissions and ambient air pollutants ($NO_2$ and $SO_2$) due to movement of vehicles and operation of machinery and equipment | Dust control measures<br>Dust fallout monitoring | Pre-Construction and Construction | Comply with NEM: AQA<br>Comply with Minimum Emission Standards<br>Comply with Dust Control Regulations |
| Vegetation clearance and excavation of construction sites | Visual intrusion as a result of movement of machinery and erecting of contractor camps as well as clearance of vegetation | Control and keep to a minimal the number of vehicles used for construction. Vehicles must be maintained to ensure efficient use of fuel. | Pre-Construction and Construction | No/minimal complaints from landowners and land occupiers<br>Comply with provisions in the EMPr |
| Transportation of material and movement of vehicles and machinery on construction areas | Increase in ambient noise levels due to movement of vehicles and machinery | Management and maintenance of construction vehicles. Management using noise dissipating technologies e.g. noise mufflers<br>Control through the limiting of the activities to the daytime and the implementation of an open and transparent channel of communication | Pre-Construction and Construction/Operation | Comply with National Noise Control Regulations,<br>Comply with Mine Health Act<br>Comply with SANS 10103:2008 |
| Vegetation clearance and excavation of construction sites | Potential destruction of graves and areas of archaeological importance | Control through clear demarcation of construction sites to ensure avoidance of burial site and 100m buffer area and other heritage sites | Pre-Construction and Construction/Operation | Comply with National Heritage Resources Act, 1999 (Act 25 of 1999)<br>Comply with HIA Specialist mitigation measures and enforce 100m buffer around the burial site |
| Vegetation clearance and excavation of construction sites | Potential sealing and loss of fossils | Management of topsoil integrity for the reuse in rehabilitation | Pre-Construction and Construction/Operation | Comply with the National Heritage Resources Act, 1999 (Act 25 of 1999)<br>Comply with recommendations from the PIA specialist. |
| Waste Management | Improper waste management has potential to contaminate water resources | Waste management | Pre-Construction and Construction/Operation | Comply with NEM:WA<br>Comply with WML |
| Vegetation clearance | Changes in the topography may be experienced as a result of bush clearing and construction vehicles on site | Control of the construction footprints and ensuring that vegetation clearance shall be kept to a minimum. No clearance of vegetation outside demarcated areas. | Pre-Construction and Construction/Operation | Ensure that the project footprint is kept to a minimum |
| Excavations | Removal of local geology as a result of construction activities | | Pre-Construction and Construction/Operation | |
| Transportation of material and movement of vehicles and machinery on construction areas | Increased traffic on public roads may result in conflicts | Speed control and limitation of the times when construction vehicles may be on the roads | Pre-Construction and Construction/Operation | Implementing mitigation measure will ensure road safety along the public roads and onsite and to increase awareness of slow-moving vehicles |
| Recruitment | Impact from the influx of job seekers and employment of farm labourers: | Management of the implementation of recruitment policies and processes | All phases | No/minimal conflicts with surrounding landowners and communities<br>Comply with Temla 13's recruitment policies. |

**Table 36-2: Impact Management Actions for the Operational Phase**

| Activity | Potential Impact | Mitigation Type | Time Period for Implementation | Compliance with Standards |
|---|---|---|---|---|
| Disposal of waste rock on the waste rock dump | Fugitive dust and fine particulate emissions affecting ambient air quality | Soil monitoring and management of spills<br>Groundwater and surface water monitoring | Operation | Comply with the requirements of the National Environmental Management: Air Quality Act, 2004: Dust Regulation guidelines for rural communities<br>Comply with the requirements of the Minimum Emission Standards |
| Transportation of product | Fugitive dust and fine particulate emissions affecting ambient air quality | Soil monitoring and management of spills | Operation | |
| Fugitive vehicle emissions from the gravel maintenance road | Fugitive dust and fine particulate emissions affecting ambient air quality | Dust control<br>Air quality monitoring | Operation | Comply with the requirements of the National Environmental Management: Air Quality Act, 2004: Comply with Dust Regulation guidelines for rural communities<br>Comply with the requirements of the Minimum Emission Standards |
| Heavy vehicle exhaust emissions | CO, $NO_2$, $SO_2$ and fine particulate emissions affecting ambient air quality | Air quality monitoring | Operation | |
| Stockpiling of discard and waste rock. Storage within slimes dams | Soil contamination due to leaching of soluble product and waste constituents into soils underlying the stockpiles; and<br>Contamination of soil adjacent to product and waste stockpiles due to run-off or seepage of soluble product or waste rock constituents. | Management and motoring of integrity of infrastructure | Operation | Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL conditions |
| Spills of chemicals (e.g., hydrocarbon).<br>Soil contamination on adjacent land potentially occurring due to inappropriate waste disposal and potential oil and diesel leakages from vehicles and machinery | Contamination of soils by hydrocarbon pollutants | Management and monitoring of spills | Operation | |
| Bulk Sampling | Contamination of groundwater resource due to seepage from waste dump areas and slimes dams into the local groundwater and subsequently decrease the water quality in the local area | Management of erosion | Operation | Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL conditions |
| | Negative impacts on local communities and livestock and safety due to the presence of pits used for bulk sampling | Control and management of access to trenches/pits | Operation | Comply with EMPr conditions |
| | Potential groundwater contamination from poor waste and sanitation management | Groundwater quality monitoring | Operation | Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL conditions |
| | Potential groundwater contamination caused by spillages and accidents | | Operation | |
| | Potential groundwater contamination caused by hydrocarbon chemicals storage | | Operation | |
| | Impact of the Removal and Alteration of Natural Water Courses on Catchment Response: The proposed shallow pits have not yet been determined; however, it will certainly cover a significant portion of the proposed project area. Inevitably, certain existing non perennial water courses that collect and convey surface water runoff to drainage lines and wetlands would be removed or altered. | Management and monitoring of water quality<br>Management and maintenance of infrastructure | Operation | Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL conditions |
| | Positive Impact of Reduced Peak Runoff and Discharge Volumes on Water Courses: The proposed prospecting development would require construction of Prospecting and bulk sampling with pits and trenches; Ablution facility; Access roads; Diesel storage; Office site; Plant site; Slimes dam; Office Area; and Vehicle parking area. Being classified as “dirty,” rain falling on this infrastructure would be captured and contained. Consequently, the quantum of surface water runoff would reduce. | N/A | Operation | N/A |
| | Loss/ change of current land use, including reduced area for run-off;<br>Soil disturbance due to excavation activities at quarry location as well as in surrounding soils.<br>Modification of natural soil hydrological regime. | Monitor and manage water quality impacts | Operation | Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL conditions |
| Vehicles and use of equipment/ machinery | Water resource contamination from hydrocarbon spills from vehicles and equipment | | Operation | Implementation of mitigation measures will ensure that the prospecting activities do not have detrimental impacts on the soils, groundwater, and surface water resources. |
| Operational activities | Establishment and spread of alien invasive species | Management and monitoring of vegetation clearance | Operation | The implementation of mitigation measures will ensure that the prospecting activities do not have detrimental impact on the area’s flora, in particular indigenous |

| Activity | Potential Impact | Mitigation Type | Time Period for Implementation | Compliance with Standards |
|---|---|---|---|---|
| | | | | species and species that are of conservation importance. |
| Movement of vehicles | Mortality and disturbance of fauna | Management and enforcement of road speed limits | Operation | Comply with NEM: BA |
| Use of heavy machinery | Changes in surface water quality due to contamination from heavy construction equipment | Surface water quality monitoring | Operation | Comply with GNR704<br>Comply with NWA<br>Comply with WUL conditions |
| Operational phase activities | Loss of ecological communities and surface water quality issues due to increased sedimentation and the potential mobilisation of pollutants | Monitoring of vegetation on site | Operation | Keep site clearance to a minimum<br>Comply with NWA<br>Comply with WUL conditions<br>Comply with NCNCA<br>Comply with NEM: BA<br>Comply with NFA |
| Operational phase noise | Noise nuisance | Management and monitoring noise levels | Operation | Comply with the National Noise Control Regulations,<br>Comply with SANS 10103:2008<br>Comply with OSHA |
| Operational phase activities | Employment | Management of the implementation of Temla 13 recruitment policy | Operation | Comply with the BBBEE Act<br>Comply with Temla 13's Employment and Recruitment Policies and targets |
| Operational phase activities | Impact of Increased Sediment Yield on Surface Water Quality on the erosion potential of the local soils, it is likely that the construction and operational phases of the proposed development would cause an increase in erosion. Thus, an increase in sediment deposition could be expected at the drainage lines and wetlands. To limit the environmental impact on faunal and floral communities, sediment yield must be reduced as far as possible. Sediment load is measured in terms of Total Suspended Solids (TSS), but through the effective design and deliberate implementation of BMP "treatment trains, its impact can be mitigated | Management and monitoring of water quality<br>Stormwater Management | Operational | Comply with GNR704<br>Comply with NWA<br>Comply with WUL conditions |
| Operational phase activities | Impact of Increased Pollutant Load on Surface Water Quality | Management and monitoring of water quality<br>Stormwater Management | Operational | Implement stormwater management plan<br>Comply with GNR704<br>Comply with NWA<br>Comply with WUL conditions |
| Operational phase activities | Health and safety risk | Manage through health and safety policies and training | Operation | Comply with NEM: AQA and MES<br>Comply with the National Noise Control Regulations,<br>Comply with SANS 10103:2008<br>Comply with MHA |
| Operational phase | Possibility of unearthing unknown graves or other buried cultural/archaeological items | Management of access to heritage resources and sites | Operation | Comply with National Heritage Resources Act, 1999 (Act 25 of 1999)<br>Comply with HIA Specialist mitigation measures |
| Movement of construction vehicles | Risk of vehicle collision | Speed control and limitation of the times when construction vehicles may be on the roads<br>Manage through road upgrades where required | Operation | Comply with public road requirements including speed limits |
| | Risk of pedestrian accidents | | Operation | |
| | Health and Safety Risk | Manage through health and safety policies and training | Operation | Maintenance of access roads and upgrade of roads where required |
| | Drilling has potential to affect the day-to-day operations by affected landowners | Manage through communication and access control | Operation | Comply with the provisions of the Mine Health Act<br>No/minimal conflict with landowners |
| | As a result of drilling activities during operation, potential damage to adjacent landowner's/occupiers' infrastructure | Manage through proper planning of drill site locations | Operation | |
| | As a result of drilling, there is potential for the occurrence of subsidence, impacting on the safety surface land dwellers and users. | | Operation | |
| | The prospecting operations will require the drilling of boreholes, which my result in the drawdown, which may affect the yield to the surrounding groundwater users. Material used for backfilling boreholes may leach pollutants, which will result in the contamination of | Rehabilitation of affected areas and control using bunds | Operation | Comply with WUL conditions<br>Comply with NWA<br>Comply with NEM;WA |

| Activity | Potential Impact | Mitigation Type | Time Period for Implementation | Compliance with Standards |
|---|---|---|---|---|
| | surrounding groundwater regime. This may spread beyond the backfilling site via plume migration. | | | Minimal/no conflict with surrounding groundwater and surface water users. |
| | Drilling operations my result in the generation of surface water runoff contaminated with drill muds and cuttings, should spillage occur.<br>The sedimentation and possible contamination with carbonaceous material will have negative impacts on the water quality due to increase turbidity and an increase in acidity of the water in the streams. | Control through management and monitoring of surface runoff | Operation | |
| | Impact of Reduction in Mean Annual Runoff on Downstream Surface Water Resources | Monitor and manage water quality impacts | Operation | |
| | Uncontrolled access to wetland areas may have an impact on the aquatic ecological habitat, ecological functioning, and structure. | Control through the enforcement s of the 32m wetland buffer<br>Manage through the implementation of the stormwater management plan | Operation | Comply with wetland specialist recommendation of 32m buffer no-go area<br>Comply with NWA<br>Comply with WUL conditions |
| | The drill rigs and towers used during the drilling operation phase will be visible from nearby locations and will have visual impact on the local communities in close proximity to the prospecting area. | Strategic location of rigs and towers to areas where there may be some tree cover, as far as practicable | Operation | Comply with EMPr mitigation measures<br>No complaints from landowners and land occupiers |
| Storage of chemicals and fuel | Spills of chemicals (e.g., hydrocarbon).<br>Soil contamination on adjacent land potentially occurring due to inappropriate waste disposal and potential oil and diesel leakages from vehicles and machinery | Management and monitoring of spills<br>Monitoring and management of the integrity of infrastructure | Operation | Comply with NEM:WA<br>Comply with NWA |

**Table 36-3: Impact Management Actions for the Decommissioning and Closure Phase**

| Activity | Potential Impact | Mitigation Type | Time Period of Implementation | Compliance with Standards |
|---|---|---|---|---|
| Spills of chemicals (e.g., hydrocarbon).<br>Soil contamination on adjacent land potentially occurring due to inappropriate waste disposal and potential oil and diesel leakages from vehicles and machinery | Spillage of chemical solutions during the dismantling of plant equipment, and infrastructure which were in contact with chemicals solution may contaminate the soils; Spillage of diesel, oils, and greases from the dismantled plant equipment, resulting in hydrocarbon contamination of exposed soils | Management and monitoring of spills | Decommissioning and closure | Comply with the closure objectives<br>Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL |
| Removal of redundant infrastructure | Soil compaction in areas where active heavy machinery will be mobilised for the shaping of the final landform; and<br>Loss of soil organic matter due to increased aeration (caused by soil disturbance) and subsequent organic matter decomposition. | Management and monitoring of soil stockpiles | Decommissioning and closure | Comply with the closure objectives |
| Borehole capping | The removal of the campsite equipment and the rehabilitation of the drilling sites and associated access infrastructure will result in the affected soil and land use being restored. This will also result in the resumption of the use of the land since the infrastructure would have been removed. | Management and monitoring of soil stockpiles | Decommissioning and Closure | Comply with the closure objectives |
| Grading of project site to ensure long-term drainage conditions on site | Soil handling to convey soil from topsoil stockpile to project site for surface rehabilitation activities, may result in degradation of soil<br>quality due to soil disturbance.<br>Contamination of soil by handling of soil with contaminated earth moving<br>Machinery (machinery previously used for handling waste such as waste rock).<br>Insufficient soil volumes to meet end land use soil requirements. | Management and monitoring of soil stockpiles | Decommissioning and closure | Comply with the closure objectives |
| Destruction of all surface infrastructure;<br>Backfill and closure of the prospecting areas trenches/pits. | Potential groundwater Contamination resulting from seepage from waste rock dump. | Groundwater monitoring | Decommissioning and closure | Comply with the closure objectives<br>Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL |
| | Potential groundwater contamination resulting from remaining surface infrastructure | Groundwater monitoring | Decommissioning and closure | Comply with the closure objectives<br>Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL |
| | Potential groundwater contamination from poor waste and sanitation management | Groundwater monitoring | Decommissioning and closure | Comply with the closure objectives<br>Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL |
| | Potential groundwater contamination caused by spillages and accidents | Groundwater monitoring | Decommissioning and closure | Comply with the closure objectives<br>Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL |
| Removal of redundant infrastructure | Spillage of chemical solutions during the dismantling of plant equipment, pipelines or pumps which were in contact with chemicals solution may contaminate the soils; Spillage of diesel, oils and<br>greases from the dismantled plant equipment, resulting in hydrocarbon contamination of exposed soils. | Management of spills<br>Water quality monitoring | Decommissioning and closure | Comply with the closure objectives<br>Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL |
| Grading of project site to ensure long-term drainage conditions on site | Soil compaction in areas where active heavy machinery will be mobilised for the shaping of the final landform; and<br>Loss of soil organic matter due to increased aeration (caused by soil disturbance) and subsequent organic matter decomposition. | Water quality monitoring | Decommissioning and closure | Comply with the closure objectives<br>Comply with NWA<br>Comply with WUL |
| Soil placement and revegetation of project site | Soil handling to convey soil from topsoil stockpile to project site for surface rehabilitation activities may result in erosion and sedimentation.<br>Contamination of soil by handling of soil with contaminated earth moving machinery (machinery previously used for handling waste such as waste rock). | Water quality monitoring | Decommissioning and closure | Comply with the closure objectives<br>Comply with NEM: WA<br>Comply with NWA<br>Comply with WUL |

| Activity | Potential Impact | Mitigation Type | Time Period of Implementation | Compliance with Standards |
|---|---|---|---|---|
| Vegetation clearing and earth works | Establishment and spread of alien invasive species | Management of alien invasive plant species<br>Monitoring of rehabilitation areas<br>Rehabilitation of affected areas | Decommissioning and closure | Comply with the closure objectives<br>Comply with NEM: BA<br>Comply with NCNCA |
| Decommissioning and closure phase activities | Permanent alteration of site topographical and visual character of the area | Management of visual impacts<br>Monitoring of rehabilitated areas | Decommissioning and closure | Comply with the closure objectives |
| Downscaling and retrenchment | Reduced regional economic development | | Decommissioning and closure | Comply with the closure objectives |
| Downscaling and retrenchment | Reduced community investment | | Decommissioning and closure | Comply with the closure objectives |
| Closure phase | The closure and rehabilitation phase should have no impact on any identified cultural and heritage resources | | Decommissioning and closure | Comply with the closure objectives<br>Comply with NHRA |
| Movement of construction vehicles | Risk of vehicle collision | | Decommissioning and closure | Comply with the closure objectives<br>Comply with public road requirements including speed limits |
| Movement of construction vehicles | Risk of pedestrian accidents | | Decommissioning and closure | Comply with the closure objectives |
| Movement of construction vehicles | Degradation of Public Roads | | Decommissioning and closure | Comply with the closure objectives<br>Maintenance of access roads and upgrade of roads where required |

# 37 Financial Provision

## 37.1 Description of closure objectives and extent to which they align with the baseline characterisation

The main aim in developing a rehabilitation plan is to mitigate the impacts caused by the project activities and to restore land back to a satisfactory end land use. The rehabilitation plan must be developed as early as possible and maintained throughout the life of operation. It is important that the project's closure plan is clearly defined and understood by all involved before starting the process and is complementary to the rehabilitation objectives.

The closure vision for the prospecting project is intended to inform the closure objectives and as such is currently stated as:

***To implement a post prospecting landscape that is safe, stable, and non-polluting over the long term, through collaboration with affected stakeholders***

The receiving environment within which the prospecting activities will be undertaken includes the following key land- uses:

- Wetlands located on the project property;
- Water resources;
- Critical Biodiversity Areas;
- Shrublands, grasses around wetlands areas; and
- Woodland/Open bush.

The overall closure objectives for the proposed project are as follows:

- Eliminate any safety risks associated with trenches//pits, drill holes and sump through adequate drill hole capping and backfilling;
- Eliminated any safety risks associate with the bulk sampling trenches;
- Prevent future environmental issues related to lateral movement through the boreholes by plugged and sealed with cement to prevent possible cross flow and contamination between aquifers;
- Remove and/or rehabilitate all pollution and pollution sources such as slimes dams, waste rock dump area, waste materials and spills;
- To establish rehabilitated areas to a state which with no susceptibility to soil erosion which may result in loss of soil, pollution of water resources;
- Restore disturbed areas and re-vegetate these areas with plant species naturally occurring in the area to restore the ecological function of the affected areas as far as practicable;
- Eliminate all alien invasive plant species from the disturbed areas
- Remove infrastructure that cannot be used by a subsequent landowner or a third party.
- Where buildings can be used by a third party, arrangements will be made to ensure their long-term sustainable use;

- Rehabilitate the disturbed land to a state that facilitates compliance with applicable environmental quality objectives,
- Landscape the rehabilitated areas in alignment with the surrounding topography to prevent the unnecessary pooling of water which will reduce the runoff in the catchment;
- Implement progressive rehabilitation measures, beginning during the construction phase wherever possible, reducing the overall visual impact;
- Physically and chemically stabilise any remaining structures to minimise residual risks;
- Leave a safe and stable environment for both humans and animals;
- To limit soil and surface/groundwater contamination by managing all water on site;
- Comply with local and national regulatory requirements;
- Form active partnerships with local communities to take care of management of the land after prospecting, where possible; and
- To maintain and monitor all rehabilitated areas following re-vegetation and, if monitoring shows that the objectives have been met, making an application for closure.

Successful rehabilitation must be monitored to ensure sustainability. This requires an understanding of the basic baseline environment, as well as project management to ensure that the rehabilitation program is a success.

## 37.2 Confirmation that environmental objectives in relation to closure have been consulted with landowners

The draft EIA/EMPr will be made available to all registered I&APs for a 30-day review and comment period. All comments received and responses provided to the stakeholders will be incorporated into the final EIA/EMPr and will be collated into a Comments and Responses Register to be submitted to the DMR with the final EIA/EMPr for decision making.

## 37.3 Rehabilitation Plan

Each phase of the prospecting activities is dependent on the success of the preceding phase. Depending on the outcome of the desktop and geological mapping phase, the prospecting drilling and trenching will be initiated. The location and extent of the trench/pits, drill and infrastructure sites cannot be determined at this stage. Mapping of the actual prospecting activities cannot be undertaken.

The management plan is provided in such a manner as to ensure concurrent rehabilitation. The areas for drilling and trenching purposes will be the main area experiencing impacts. The impacts will be temporary in nature, and a detailed management plan has been provided to address the potential impacts associated with these activities.

Annual reviews to be undertaken in terms of regulations 6 (a) and 11 (1)(a) of the NEMA Financial Regulations, that form part of the Annual Environmental Audit, assesses what closure objectives and criteria are being achieved through the implementation of the plan.

While some disturbed areas can be rehabilitated on a progressive basis during construction and operation, others cannot be rehabilitated until prospecting is complete. For this reason, some rehabilitation is generally still required during and after closure.

The main rehabilitation that will specifically be required is trench/pit backfilling, borehole capping and revegetation:

- Borehole Capping: Drill holes will be permanently capped as soon as is practicable.
- Trench backfilling: The remediation and rehabilitation of trenches/pits to remove the hazard they present to people and animals. All trenches/pits must be backfilled and rehabilitated as soon as is practicable to the pre-prospecting condition. This may be achieved through earthworks and contouring the trenches to as close as possible to the pre-prospecting topography. This includes filling the trenches and excavations; making trenches/pits' sides safe and covering the surface area with subsoil and topsoil as necessary; and mitigation or restoration of all surface disturbances and revegetation of the slopes and waste rock dumps.
- Slimes dams: The slimes dams must be backfilled and rehabilitated to the pre-prospecting condition.
- Removal and isolation of potential pollutants from the environment. Containment and treatment of contaminated water and correct storage and removal of hazardous materials. Waste rock present specific problems, as they are unsuitable for other uses. For this reason, all waste rock and even low-grade product produced are destined to remain in the environment.
- Surface Infrastructure: that cannot be used for other purposes or by third parties must be removed and rehabilitated to the pre-prospecting condition.
- Re-vegetation: A suitably qualified ecologist will be appointed to determine the appropriate species that may be used for re-vegetating the area.

Re-vegetation efforts will be monitored every second month for a period of 6 months after the initial seeding. An effective vegetation cover of 45% must be achieved. Re-seeding will be undertaken if the vegetation cover has not been achieved after 6 months.

The basic rehabilitation methodology will strive to replicate the pre-prospecting topography, wherever possible, or at least not to increase overall slope gradients without emplacement of adequately designed erosion control or runoff diversion structures.

## 37.4 Explain why it can be confirmed that the rehabilitation plan is compatible with closure objectives

The management plan is in such a manner as to ensure concurrent rehabilitation. The closure objectives are to return the land disturbed by prospecting activities back to its pre-prospecting original condition. The rehabilitation plan provides the detail on how this will be achieved as detailed in Section 37.3.

## 37.5 Quantum of financial provision required to manage and rehabilitate the environment

The financial provision for the environmental rehabilitation and closure of any mine /prospecting and its associated operations forms an integral part of the MPRDA. Sections 41 (1) and, 41 (2), 41 (3) and 45 of the MPRDA deal with the financial provision for rehabilitation and closure. During 2012, the DMR made updated rate available for the calculation of the closure costs, where contractor's costs are not available, these apply.

With the determination of the quantum for closure, it must be assumed that the infrastructure had no salvage value (clean closure). The closure cost estimate (clean closure) was determined in accordance with the DMR guidelines.

The amount required to cover the rehabilitation is anticipated to be R473 743.00 at this stage as shown in Table 37-1.

## Table 37-1: Closure Cost Estimate

| No. | Description | Unit | A<br>Quantity | B<br>Master Rate | C<br>Multiplication factor | D<br>Weighting factor 1 | E=A*B*C*D<br>Amount (Rands) |
|---|---|---|---|---|---|---|---|
| 1 | Dismantling of processing plant and related structures (including overland conveyors and powerlines) | m3 | 200 | **R 18.91** | 1 | 1 | 3782 |
| 2 (A) | Demolition of steel buildings and structures | m2 | 0 | **R 259.45** | 1 | 1 | 0 |
| 2(B) | Demolition of reinforced concrete buildings and structures | m2 | 0 | **R 377.62** | 1 | 1 | 0 |
| 3 | Rehabilitation of access roads | m2 | 2000 | **R 44.64** | 1 | 1 | 89280 |
| 4 (A) | Demolition and rehabilitation of electrified railway lines | m | 0 | **R 433.26** | 1 | 1 | 0 |
| 4 (A) | Demolition and rehabilitation of non-electrified railway lines | m | 0 | **R 236.33** | 1 | 1 | 0 |
| 5 | Demolition of housing and/or administration facilities | m2 | 0 | **R 498.91** | 1 | 1 | 0 |
| **6** | **Opencast rehabilitation including final voids and ramps** | **ha** | **0.3** | **R 253 918.43** | **0.52** | **1** | **39611.27508** |
| 7 | Sealing of shafts adits and inclines | m3 | 0 | **R 133.92** | 1 | 1 | 0 |
| 8 (A) | Rehabilitation of overburden and spoils | ha | 0.1 | **R 174 355.57** | 1 | 1 | 17435.557 |
| 8 (B) | Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential) | ha | 0.01 | **R 217 156.72** | 1 | 1 | 2171.5672 |
| 8 ( C ) | Rehabilitation of processing waste deposits and evaporation ponds (polluting potential) | ha | 0 | **R 630 726.04** | 1 | 1 | 0 |
| 9 | Rehabilitation of subsided areas | ha | 0 | **R 145 996.53** | 1 | 1 | 0 |
| 10 | General surface rehabilitation | ha | 1 | **R 138 119.02** | 1 | 1 | 138119.02 |
| 11 | River diversions | ha | 0 | **R 138 119.02** | 1 | 1 | 0 |
| 12 | Fencing | m | 0 | **R 157.55** | 1 | 1 | 0 |
| 13 | Water management | ha | 0.2 | **R 52 516.74** | 1 | 1 | 10503.348 |
| 14 | 2 to 3 years of maintenance and aftercare | ha | 2 | **R 18 380.86** | 1 | 1 | 36761.72 |
| 15 (A) | Specialist study | Sum | 0 | | | 1 | 0 |
| 15 (B) | Specialist study | Sum | | | | 1 | 0 |
| | | | | | Sub Total 1 | | 337664.4873 |

| | | | | |
|---|---|---|---|---|
| 1 | Preliminary and General (12.0% of Subtotal 2) | 40519.73847 | **weighting factor 2** 1 | 40519.73847 |
| 2 | Contingencies (10.0% of Subtotal 2) | 33766.44873 | | 33766.44873 |
| | | | Subtotal 2 | 411950.67 |
| | | | VAT (15%) | 61792.60 |
| | | | **Grand Total** | **473743** |

The Master Rates will be updated on an annual basis, based on Consumer Price Index (CPIX) or a similar approved method, or should legislation change. The first of these updates will take place during 2024 and continue to the year in which the review is taking place, and the overall document will be reviewed and updated whenever necessary (minimum requirement of annual updates).

## 37.6 Confirmation that the financial provision will be provided as determined

The amount required to cover the rehabilitation is estimated to be R473 743.00 at this stage. Work will be carried out by the contractors and consultant and the costs are included in the estimate provided in Table 37-1.

Temla 13 will fund the operation and hereby undertakes to fund the operations and to manage the operations. The applicant (Temla 13) hereby confirms that the financial provision will be provided as determined in Table 37-1.

# 38 Compliance monitoring and performance assessment

Temla 13 will be responsible for the implementation of all monitoring, mitigation, and management measures, as well as compliance with the EMPr. The recommended monitoring for the identified impacts is detailed below. The applicant will keep a record of all environmental monitoring taken on site.

## 38.1 Monitoring of Impact Management Actions

Please refer to Table 38-1

## 38.2 Monitoring and Reporting Frequency

Please refer to Table 38-1.

## 38.3 Responsible Persons (Roles and Responsibilities)

Generic roles that require to be defines for the project include:

- Competent Authority;
- Project Developer;
- ECO;
- Environmental Health and Safety (EHS) Manager; and
- Site Manager.

The typical requirements of each of the roles are provided in the following sections.

### 38.3.1 Competent Authority (DMR)

The DMR plays a lead role in the implementation of environmental policies, legislation, and regulations. Their role is to ensure that the construction and operation of the proposed prospecting activities are conducted in a sustainable manner, in compliance with the relevant environmental legislation. DMR is responsible for approving the EMPr for the project and any revisions and amendments thereto.

### 38.3.2 Project Developer (Temla 13)

The Project Developer (Temla 13) is the ‘owner’ of the project and as such is responsible for ensuring that the conditions of the Environmental Authorisation issued in terms of NEMA (should the project receive such authorisation) are fully complied with, as well as ensuring that any other necessary permits or licenses are obtained and complied with. It is expected that Temla 13 will appoint the Environmental Control Officer, EHS Manager and Site Manager.

Temla 13 will be responsible for:

- Ensuring that all team members are aware of their roles and responsibilities;
- Taking overall responsibility for all activities that occur in the proposed project and associated infrastructure;

- Ensuring that all commitments/conditions contained in the EA and EMPr are communicated and adhered to by Temla 13 employees to all team members and contractors.

During the *construction phase* Temla 13 must:

- Appoint a Project Management Team to oversee the Contractor and act as a liaison between the ECO and the Contractor;
- Ensure that the Contractor is aware of and adheres to the provisions of this EMPr;
- Ensure that the Contractor remedies problems timeously and to the satisfaction of the authorities;
- Appoint an independent and suitably qualified ECO to ensure that the Contractor abides by the EMPr;
- Ensure that an independent ECO audits the site to ensure compliance with the respective environmental legislation by parties.

During the *operation phase* Temla 13 must:

- Ensure that the Project Management Team oversees the Contractor and act as a liaison between the ECO and the Contractor/s;
- Ensure that the Contractor is aware of and adheres to the provisions of this EMPr;
- Ensure that the Contractor remedy problems timeously and to the satisfaction of the authorities;
- Ensure that an independent ECO audits the site to ensure compliance with the respective environmental legislation by parties.

During *decommissioning phase* Temla 13 must:

- Ensure that the Project Management Team oversees the Contractor and act as a liaison between the ECO and the Contractor/s;
- Ensure that the Contractor is aware of and adheres to the provisions of this EMPr;
- Ensure that the Contractor remedy problems timeously and to the satisfaction of the authorities;
- Ensure that an independent ECO audits the site to ensure compliance with the respective environmental legislation by parties.

### 38.3.3 Contractor (s)

The Contractor (s) (including Sub-Contractors) will report to the Project Management Team and be responsible for:

- Appointing an Environmental Representative who will ensure that all construction activities on site are undertaken in accordance with the EMPr;
- Drafting Environmental Method Statements to mitigate environmental impacts;
- Informing all employees and sub-contractors of their roles and responsibilities in terms of the EMPr;
- Ensuring that all employees and sub-contractors comply with this EMPr;

- Complying with the EMPr, EA and WML commitments and any other legislative requirements as applicable to their workings;
- Adhering to any instructions issued by the project manager on advice of the ECO;
- Submitting an environmental report at identified site meetings on the environmental incidents that have occurred within the period before the site meeting;
- Arranging that all employees and those of the subcontractors receive appropriate training prior to the commencement of construction, taking cognisance of this EMPr, EA and WML.

The Contractor has a duty to demonstrate respect and care for the environment in which they are operating. The Contractor will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation.

### 38.3.4 Site Manager

The site manager will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction of the facility.
- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project construction.
- Promoting total job safety and environmental awareness by employees, contractors and sub-contractors and ensuring that all employees and contractors and sub-contractors are aware of the importance that the project proponent attaches to safety and the environment.
- Ensuring that each subcontractor employ an Environmental Officer (or have a designated Environmental Officer function) to monitor and report on the daily activities on-site during the construction period.
- Ensuring that safe, environmentally acceptable working methods and practices are implemented, and that sufficient plant and equipment is made available, is properly operated, and maintained in order to facilitate proper access and enable any operation to be carried out safely.
- Meeting on site with the Environmental Health and Safety (EHS) Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Ensuring that all appointed contractors and sub-contractors are aware of this EMPr and their responsibilities in relation to the programme.
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the EHS Manager.

### 38.3.5 Environmental Control Officer

An independent ECO must be appointed to monitor the compliance of the proposed project with the conditions of Environmental Authorisation (should such authorisation be granted by DMR)

during the construction phase (and possibly the operational phase, depending on the requirements of DMR). The ECO must also monitor compliance of the proposed project with environmental legislation and conditions of the EMPr. The roles and responsibilities of the ECO should include the following:

- The ECO must undertake periodic environmental audits during the relevant phases of the proposed project in order to monitor and record environmental impacts and non-conformances. It is recommended that weekly or bi-weekly environmental audits be undertaken by the ECO during the construction phase.
- Environmental compliance reports must be submitted by the ECO to the DMR on an annual basis or as stipulated by the DMR.
- The ECO must maintain a diary of site visits and audits, a copy of the Environmental Authorisation (should such authorisation be granted by DMR) and relevant permits for reference purposes, a non-conformance register, a public complaint register, and a copy of previous environmental audits undertaken.
- Prior to the commencement of construction, the ECO must meet on site with the Site Manager to confirm the construction procedure and designated construction areas.

### 38.3.6 Safety, Health, and Environmental Representative

The EHS Manager will be appointed to fulfil the roles of the Environmental Officer during the construction phase and the Environmental Manager during the operational phase. The responsibility of the EHS Manager include overseeing the implementation of the EMPr during the construction and operational phases, monitoring environmental impacts, record-keeping and updating of the EMPr as and when necessary. The EHS Manager is also responsible for monitoring compliance with the conditions of the Environmental Authorisation that may be issued to Temla 13

The lead contractor and sub-contractors may have their own Environmental Officers or designate Environmental Officer functions to certain personnel.

During construction, the EHS Manager will be responsible for the following:

- Meeting on site with the Site Manager prior to the commencement of construction activities to confirm the construction procedure and sites allocated for the project areas and infrastructure required for the project.
- Daily or weekly monitoring of site activities during construction to ensure adherence to the specifications contained in the EMPr and Environmental Authorisation (should such authorisation be granted by DMR), using a monitoring checklist that is to be prepared at the start of the construction phase.

## 38.4 Time Period for Implementing Impact Management Actions

Please refer to Table 38-1.

## 38.5 Mechanism for Monitoring Compliance

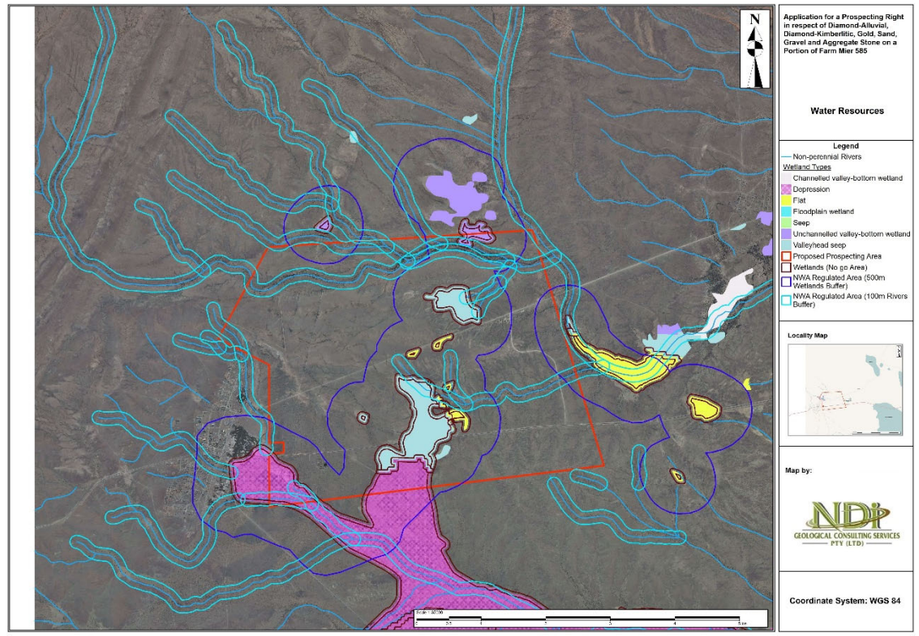
Please refer to Table 38-1.

**Table 38-1: Compliance monitoring and performance assessment against EMPr**

| Aspect | Impacts requiring monitoring programmes / objectives | Functional requirements for monitoring | | | Roles and responsibilities | Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions |
|---|---|---|---|---|---|---|
| | | Detailed Actions | Monitoring Location | Parameters | | |
| Air quality | • Construction phase impacts and operational phase impacts | • Six (6) months prior to the construction phase (as agreed with the ECO), a suitable baseline dust fallout and particulate monitoring network should be installed along the boundary of the project area to establish baseline concentrations prior to the construction phase;<br>• During construction, the baseline monitoring network should be maintained along the boundary of the project area to meet the NEM: AQA requirements;<br>• The air monitoring network to include at a minimum dust fallout, $PM_{10}$, $PM_{2.5}$ and gaseous monitoring ($SO_2$ and $NO_2$); and<br>• Any complaints as to the management of onsite air quality should be directed to the site management. Complaints and any actions arising from a complaint will be recorded in a complaint register to be maintained by site management. | | | Temla 13, ECO, Contractors | Monthly monitoring and reporting |
| Soil quality | • Maintain the soil quality along areas which will be developed for the project. | • Collection of at least one sample where visible signs of contamination is noted (spillage or seepage areas/zones) | • All areas which will be developed for prospecting | • pH and salinity;<br>• Major anions and cations;<br>• Sulphate, phosphate, Nitrate, total dissolved solids, electrical conductivity;<br>• Heavy metals and hydrocarbons | Temla 13, ECO, Contractors | Biannually |
| Soil stockpiles | • Maintain and minimise the quality and degradation of soil stockpiles | • Collection of at least one composite sample per stockpile | • Soil stockpiles | • pH and Salinity;<br>• Major anions and cations;<br>• Organic matter content for the topsoil;<br>• Content of major plant nutrients (CEC);<br>• Major cations and anions;<br>• Metal and hydrocarbons;<br>• Stockpile height (<3 m). | Temla 13, ECO, Contractors | Biannually |
| Soil erosion | • Mitigate and minimise soil erosion | • Infrastructure and surface water bodies on-site to be maintained in accordance with the surface water management plan | • Soil stockpiles<br>Developed areas Haul roads | • Visual assessment of soil stockpile heights and conditions (i.e., gullies and rills);<br>• Assess the condition and effectiveness of vegetation on the stockpiles;<br>• Assess any evidence of erosion (as per the Surface water management plan); | Temla 13, ECO, Contractors | Quarterly |

<table>
<tr><th rowspan="2">Aspect</th><th rowspan="2">Impacts requiring monitoring programmes / objectives</th><th colspan="3">Functional requirements for monitoring</th><th rowspan="2">Roles and responsibilities</th><th rowspan="2">Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions</th></tr>
<tr><th>Detailed Actions</th><th>Monitoring Location</th><th>Parameters</th></tr>
<tr><td></td><td></td><td></td><td></td><td>• Assess the effectiveness of water versus other dust suppression substances (e.g., molasses or bitumen).</td><td></td><td></td></tr>
<tr><td>Land Use change</td><td>• Maintain and minimise land use change within the project area</td><td>• Evaluation of changes in land use around the project area using satellite imagery</td><td>• Prospecting Right Area</td><td>• Collection of satellite imagery</td><td>Temla 13, ECO, Contractors</td><td>Every two years</td></tr>
<tr><td>Rehabilitated Areas</td><td>• Maintain the quality and condition of rehabilitated areas</td><td>• Continuous monitoring of rehabilitated areas for closure compliance</td><td>• Disturbed areas</td><td>• Organic content of topsoil;<br>• Content of major plant nutrients;<br>• Contamination assessment (pH, metals, hydrocarbons, electrical conductivity, total dissolved solids, nitrates, sulphate, and phosphates);<br>• Volume of soil replaced;</td><td>Temla 13, ECO, Contractors</td><td>Annually</td></tr>
<tr><td>Groundwater</td><td>• Monitoring of groundwater quality</td><td colspan="3">• Groundwater quality monitoring must be undertaken and analysed for the following parameters:<br>pH, Electrical Conductivity (EC), Total Dissolve Solids (TDS - call), Alkaline (Alk), Chloride (Cl), Sulphate (SO4), Nitrate ( NO3), Ammonia ( NH4), Fluoride ( F), Calcium ( Ca), Magnesium ( Mg), Sodium ( Na), Potassium ( K), Aluminium (Al), Iron ( Fe), Manganese ( Mn), Chromium ( Cr), Copper (Cu), Nickel (Ni), Zinc (Zn), Cadmium (Cd), Lead ( Pb), E coli, Total coliform, NTU, Total Hardness (Thard - cal), Total Organic Carbon (TOC), Cyanide Screening, Langelier Saturation Index – cal<br>• The groundwater quality of the boreholes on site must be measured as shown in the table below:
<table>
<tr><th>Identifier</th><th>Type</th><th>Latitude</th><th>Longitude</th><th>Farm Name</th></tr>
<tr><td>40223</td><td>Borehole</td><td>-26.75733</td><td>20.03259</td><td>Rietfontein 108</td></tr>
<tr><td>40222</td><td>Borehole</td><td>-26.75678</td><td>20.03481</td><td>Rietfontein 108</td></tr>
<tr><td>38378</td><td>Borehole</td><td>-26.74094</td><td>20.03619</td><td>Rietfontein 108</td></tr>
<tr><td>38377</td><td>Borehole</td><td>-26.74084</td><td>20.02948</td><td>Rietfontein 108</td></tr>
<tr><td>38380</td><td>Borehole</td><td>-26.72194</td><td>20.03688</td><td>Rietfontein 108</td></tr>
</table>
• Additional monitoring points must be identified around the chemical storage areas, slimes dams and waste rock dump areas. At one monitoring borehole must be established upstream and downstream of the chemical storage areas, slimes dams and waste rock dump.</td><td>Temla 13, ECO, Contractors<br>Groundwater specialist</td><td>Water quality monitoring on a quarterly basis during construction and operation</td></tr>
<tr><td></td><td>• Monitoring of groundwater levels</td><td colspan="3">• Ensure that no groundwater extraction is undertaken without approval from the DWS<br>• Monitoring water levels of the boreholes found in close proximity to the proposed project site, through a flow meter and water level data logger.<br>• The water level depth of the boreholes on site must be measured as shown in the table below:</td><td>Temla 13, ECO, Contractors<br>Groundwater specialist</td><td>Monthly monitoring and reporting</td></tr>
</table>

| Aspect | Impacts requiring monitoring programmes / objectives | Functional requirements for monitoring | | | | | Roles and responsibilities | Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions |
|---|---|---|---|---|---|---|---|---|
| | | Detailed Actions | | Monitoring Location | | Parameters | | |
| | | Identifier | Type | Latitude | Longitude | Farm Name | | |
| | | 40223 | Borehole | -26.75733 | 20.03259 | Rietfontein 108 | | |
| | | 40222 | Borehole | -26.75678 | 20.03481 | Rietfontein 108 | | |
| | | 38378 | Borehole | -26.74094 | 20.03619 | Rietfontein 108 | | |
| | | 38377 | Borehole | -26.74084 | 20.02948 | Rietfontein 108 | | |
| | | 38380 | Borehole | -26.72194 | 20.03688 | Rietfontein 108 | | |
| Surface water | • Downstream water quality | • Establish a surface water monitoring programme upstream and downstream of the project area<br>• Surface water will be monitored for E coli, Dissolved Oxygen, pH, Electrical Conductivity (EC), Suspended Solids and Total Dissolved Substances | | | | | Temla 13, ECO, Contractors, water quality specialist | Monthly monitoring and reporting |
| Surface water | • Earth works and vegetation clearing during construction, operation, and decommissioning | • Assess area for erosion and spillages | | | | | Temla 13, ECO, Contractors, water quality specialist | Weekly or daily during high rainfall periods until construction and decommissioning are complete |
| Surface water | • Use and storage of chemicals, including refueling areas | • Maintain storage areas;<br>• Clean and dispose in accordance with legislation. | | | | | Temla 13, ECO, Contractors, water quality specialist | Daily inspection to ensure no leaks are visible;<br>Clean-up in the event of spills. |
| Surface water | • Operations | • Monitor and maintain stormwater management infrastructure;<br>• Clean and dispose in accordance with legislation. | | | | | Temla 13, ECO, Contractors, water quality specialist | Weekly or daily inspection during high rainfall periods;<br>Monthly/ quarterly water quality samples for downstream water resources. |
| Wetlands and Aquatic Ecosystems | • Wetland Area and Aquatic Ecosystem Loss | • Ensure that there are construction activities that will be located within any wetland and aquatic ecosystem areas as well as the 32m buffer areas around the wetland areas.<br>• Demarcate and fence off wetland areas and 32 m buffer zones as no-go zones as provided below. | | | | | ECO, Site Manager | Monthly monitoring and reporting |

| Aspect | Impacts requiring monitoring programmes / objectives | Functional requirements for monitoring | | | Roles and responsibilities | Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions |
|---|---|---|---|---|---|---|
| | | Detailed Actions | Monitoring Location | Parameters | | |
| | |  | | | | |
| Terrestrial Ecology | • Establishment and spread of alien invasive species. | • An alien invasive species (AIS) control programme must be developed and implemented during all phases of the proposed project;<br>• AIS control should be undertaken in both the project site, and natural habitat and rehabilitated areas immediately adjacent to the site;<br>• It is recommended that the programme include:<br>o A combined approach using both chemical and mechanical control methods;<br>o Periodic follow-up treatments, informed by regular monitoring; and<br>o Monitoring should take place in disturbed areas, as well as adjacent undisturbed areas. | | | Temla 13, ECO, Contractors, Ecologist | Bi-annually |
| | • Loss of Indigenous plant Species | • A suitably ecologist or horticulturist will be required to make recommendations regarding the collection, propagation/storage and transplantation of plants is advised. | | | ECO, Site Manager | Monthly monitoring and reporting. Monitoring will be required at all the construction and operational activities until such time that rehabilitation is completed, and sustainability of vegetation cover is achieved. |
| | • Faunal Habitat Loss | • Adhere to law and best practice guidelines regarding the displacement and relocation of CI fauna<br>• Where required fauna shall be relocated to an area with a similar habitat as the project area<br>• Time construction activities to minimise faunal mortality<br>• Poaching of fauna shall be prohibited | | | ECO, Site Manager | Monthly monitoring and reporting. Monitoring will be required at all the construction and operational activities until such time that rehabilitation is completed, and sustainability of vegetation cover is achieved. |

| Aspect | Impacts requiring monitoring programmes / objectives | Functional requirements for monitoring | | | Roles and responsibilities | Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions |
|---|---|---|---|---|---|---|
| | | Detailed Actions | Monitoring Location | Parameters | | |
| | | • Uncontrolled fires shall not be permitted on site and persecution or hunting of fauna | | | | |
| Noise | • Noise Receptors | • One month prior to the construction phase, a suitable baseline noise monitoring campaign should be undertaken at the nearby sensitive receptors to establish baseline concentrations prior to the construction phase<br>• Measure noise levels routinely to ensure the noise levels are being kept within the acceptable ISO standards.<br>• Any noise complaints should be directed to the site management. Complaints and any actions arising from a complaint will be recorded in a complaint register to be maintained by site management. | | | Temla 13, ECO, Contractors | During construction, noise monitoring should be implemented quarterly;<br>During operations, noise monitoring should be implemented on an annual basis; |
| Drilling | • Vibrations<br>• Destruction/damage to infrastructure | • Ground vibration should be part of such a monitoring program:<br>• A crack survey and vibration monitoring should be conducted at the nearest residence for each cycle<br>• A complaints register must be kept on site for instances where drilling results in destruction to infrastructure | | | Prospecting Engineer<br>ECO<br>SHE Officer | As and when required |
| Visual | • Visual Intrusion and loss of sense of place | • Visual monitoring shall be implemented at Key Observational Points (KOPs) which must be identified around the project area;<br>• The visual monitoring programme will be based on the following parameters:<br>o Airborne dust (in line with air quality assessment)<br>o Visibility of lights at night from surrounding receptors;<br>o Number of lights visible;<br>o Visibility of drill rigs and infrastructure;<br>o Vegetation cover and height; and<br>o Disturbance to receptors. | | | Contractors<br>Temla 13<br>ECO | Annual |
| Traffic | • Risk of vehicle collision<br>• Risk of pedestrian accidents<br>• Degradation of Public Roads | • Develop a detailed traffic management plan that takes the following into account:<br>o Indicate areas where heavy vehicles will be expected with adequate signage.<br>o Cover materials being transported with tarpaulins where possible,<br>o Dust suppression on roads.<br>o Educate drivers on potential areas of high pedestrian activity.<br>o Educate community on dangers of construction vehicles new to their area.<br>o The deterioration of public roads over time must be monitored and a maintenance plan must be negotiated with the Provincial Authority. | | | Contractors, Temla 13 | As and when required |
| Health and Safety | • Health and safety of personnel | • Routine safety checks, safety training and Inspections to be carried out during the construction and operation phase to enforce the use of Personnel Protective Equipment (PPE). This must also be included in the safety requirements of the Contract. | | | ECO, Site Manager, Contractor | Routine inspection and Quarterly reporting |

| Aspect | Impacts requiring monitoring programmes / objectives | Functional requirements for monitoring | | | Roles and responsibilities | Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions |
|---|---|---|---|---|---|---|
| | | Detailed Actions | Monitoring Location | Parameters | | |
| Waste Management | • Waste Management | • Maintain a waste manifest book to record volumes of waste leaving the site, including recyclables.<br>• Keep safe disposal certificates on file on site for Hazardous waste.<br>• Way Bridge slips must be obtained for all other waste streams and kept on file on site | | | ECO, Site Manager | Monthly daily and report on a monthly basis |
| Heritage resources | • Destruction of graves and cultural resources | • No activities within 100m of the burial site as indicated in Figure 13-2. The no-go areas muse be cordoned off or fenced off to ensure no access by personnel and site visitors.<br>• No activities shall impact graves and sites of heritage or cultural importance without a permit from SAHRA<br>• Chance finds protocol must be implemented where heritage resources are uncovered. | | | ECO, Site Manager<br>Heritage Specialist-when required | Monthly monitoring and reporting |
| Paleontology | • Destruction and sealing of fossils | • No activities shall impact fossils without a permit from SAHRA<br>• Chance finds protocol must be implemented where heritage resources are uncovered. | | | ECO, Site Manager<br>Paleontologist, when required | Monthly monitoring and reporting |
| Stormwater Management | • Stormwater Management | • Visual monitoring based on sediment<br>• Clean water must be kept separate from contaminated water emanating from the project sites | | | ECO, Site Manager | Monthly daily and report on a monthly basis<br>Annual GN704 audits |
| Rehabilitation | • Rehabilitation | • Monitoring of the following:<br>o Basal Cover<br>o Arial Cover<br>o Species diversity | | | ECO, Site Manager | Rehabilitation will be undertaken throughout all the project phases. The final rehabilitation will be undertaken when the prospecting activities have been finalised.<br>The ECO shall inspect the affected areas 6 month after finalisation of rehabilitation to assess the success of the rehabilitation. |

# 39 Frequency of submission of performance assessment report

A monthly site visit and report shall be compiled by the ECO and will include all aspects of the EMPr, as required.

Annual environmental audits must be undertaken to ensure compliance with the EMPr and EA/WML. The environmental audit reports must also include the financial provision and must be submitted to the DMR.

# 40 Environmental Awareness Plan

It is important to ensure that the Contractors and employees associated with the proposed project the appropriate level of training and awareness to ensure that continual environmental due diligence and conservation is exercised at all levels of work carried out. Employees, contractors, and sub-contractors must be made aware of their responsibilities in terms of relevant legislation, guidelines as well as this EMPr and EA.

Environmental conditions will be included in the contracts issued to the contractors, making them aware of the potential environmental impacts and risks associated with the proposed project. The importance of implementing the conditions in the EMPr and the necessity of good housekeeping practices will be made known to the contractors and employees of Temla 13 and the contractors in order to prevent accidental spillages and avoid subsequent environmental impacts.

Training needs will be identified based on the EMPr requirements and capacity of Temla 13 employees and contractors. In order to ensure environmental due diligence and protection of environmental harm, it is vital that all employees are trained to perform their designated role in alignment with the EMPr and EA.

The aim of the environmental awareness plan is to:

- Promote environmental education and conservation within the working place;
- Inform employees and contractors on the applicable environmental procedures and programmes;
- Provide job specific training on the specification of environmental conservation and protection applicable to the respective construction activities.

## 40.1 Communication of environmental risks

The training pertaining to the environmental awareness will include the following:

- All personnel (construction and operation staff) will undergo induction, which as a minimum will include Safety, Health, and Environmental awareness;
- All attendees will sign an acknowledgement register upon receiving and understanding the induction;
- Environmental risks will be identified together with the specific job training that may be required to address these risks. Construction and operation staff will be trained on the implementation of emergency procedures where relevant.

An Environmental Awareness and Risk Assessment Schedule has been developed and is outlined in Table 40-1. The purpose of this schedule is to ensure that onsite employees are not only rained, but that the principles are continuously re-enforced.

**Table 40-1: Environmental Training and Awareness Schedule**

| Frequency | Time allocation | Objective |
|---|---|---|
| Induction (all staff and workers) | 1-hour training on environmental awareness | Develop an understanding of what is meant by the natural environmental and social environment and establish a common language as it relates to |

| Frequency | Time allocation | Objective |
|---|---|---|
| | training as part of site induction | environmental, health, safety, and community aspects.<br>Establish a basic knowledge of the environmental legal framework and consequences of non -compliance.<br>Clarify the content and required actions for the implementation of the EMPr.<br>Confirm the spatial extent of areas regarded as sensitive and clarify restrictions.<br>Provide a detailed understanding of the definition, the method for identification and required response to emergency incidents. |
| Monthly Awareness Talks (all staff and workers) | 30 minutes awareness talks | Based on actual identified risks and incidents (if occurred) reinforce legal requirements, appropriate responses, and measures for the adaptation of mitigation and/or management practices. |
| Risk Assessments (supervisor and workers involved in task) | Daily task-based risk assessment | Establish an understanding of the risks<br>associated with a specific task and the required mitigation and management measures on a daily basis as part of daily toolbox talks. |

## 40.2 Mitigation and management of Environmental Risks

As prescribed in Table 40-1, Task/Issue based Risk Assessments must be undertaken with all workers involved in the specific tasks in order to establish an understanding of the risks associated with a specific task and the required mitigation and management measures contained in this report.

### 40.2.1 Environmental Awareness Training Content

Induction Training: The following environmental awareness training will be provided to all staff and workers who will be involved in all the activities at the project site:

- Description of the approved activities and content of the prospecting right;
- An overview of the applicable legislation and regulations as they relate to environmental, health, safety, and community;
- Content and implementation of the approved EMPr specifically:
    - Allocated roles and responsibilities;

- Management and mitigation measures; and
- Identification of risks and requirements adaptation.

- Sensitive environments and features:
- Description of environmentally sensitive areas and features; and
- Prohibitions as it relates to activities in or in proximity to such areas.
- Emergency Situations and Remediation:
  - Methodology for the identification of areas where accidents and emergencies may occur, communities and individuals that may be affected;
  - An overview of the response procedure;
  - Equipment and resources;
  - Designate of responsibilities;
- Communication, including communication with the potentially affected communities and responsible authorities; and
- Training schedule to ensure effective response.

### 40.2.2 Development of procedures and checklists

The following procedures will be developed, and all staff and workers will be adequately trained on the content and implementation thereof:

- Emergency Preparedness and Response: The procedure will be developed to specifically include risk identification, preparedness, response measures and reporting. The procedure will specifically include spill and fire risk, preparedness, and response measures. The appropriate emergency control centres (fire department, hospitals etc.) will be identified and the contact numbers obtained and made available on site. The procedure must be developed in consultation will potentially affected landowners. In the even that risks are identified, which may affect adjacent landowners (or other persons), the procedure will include appropriate communication strategy to inform such persons and provide response measures to minimize the impact.
- Incident Reporting Procedure: Incident reporting will be undertaken in accordance with an established incident reporting procedure to:
  - Provide details of the responsible person, including any person who
  - Is responsible for the incident;
  - Owns any hazardous substance involved in the incident;
  - Was in control when the incident occurred.
  - Provide details of the incident (time, date, location);
  - The details of the cause of incident;
  - Identify aspects of the environment affected;
  - The details of corrective action taken; and

  - The identification of any potential residual or secondary risks that must be monitored and corrected or managed.

- Environmental and Social Audit Checklist: An environmental audit checklist will be established to include the environmental and social mitigation and management measures as developed and approved as part of the EMPr. Non-conformances will be identified, and corrective action taken where required.

# 41 Manner in Which Risks Will Be Dealt with In Order to Avoid Pollution or The Degradation of The Environment

The effectiveness and efficiency of this plan will be monitored by the performance of annual audits aimed at testing the environmental awareness of employees directly and the analysis of the root causes of environmental incidents, including non- conformance to legal requirements, to determine which incidents were caused by a lack of environmental awareness and training. Temla 13 will establish a trained and equipped emergency response team to deal with foreseeable incidents such as fires, accidents, and environmental impacts and to evaluate the Environmental Awareness Plan. This evaluation will entail the auditing of the operation during the construction and operation phase once the activity has commenced.

Management shall establish and maintain procedures for the internal communication between the various levels and functions of the organisation, and receiving, documenting, and responding to relevant communication from external I&APs. The organisation shall consider processes for external communication on its significant environmental aspects and record its decision. Communication is a management responsibility. All line supervisors are responsible for effective communication within their own sections. Environmental risks will be dealt with through training and communication to ensure minimal degradation of the environment.

The Environmental Awareness Plan should be sufficient to make all those involved with the project aware of those risks that may occur as well as the necessary mitigation required to minimise these risks. Totapix and its contractors should take the Environmental Awareness Plan seriously in order to show that they are sensitive to the environment’s well–being, empowerment of the local people and returning the land to appropriate use once the reclamation activities have been completed.

Non-compliance should be dealt with by the SHE and site manager on a case-to-case basis. Secondary offenders or serious offences should be dealt with immediately, and where necessary disciplinary hearings and suspension should be considered.

# 42 Specific Information Required by The Competent Authority)

All information committed to in the scoping report and as requested by the DMR to date has been incorporated in the EIA/EMPr Report.

The financial provision for the environmental rehabilitation and closure requirements of prospecting operations is governed by NEMA, as amended, which provides in Section 24P that the holder of a prospecting right must make financial provision for rehabilitation of negative environmental impacts. The financial provision will be reviewed annually as required by the DMR.

# 43 Conclusion and Recommendations

Ndi Geological has undertaken the EIA and EMPr for the proposed prospecting by Temla 13 in accordance with the requirements of the NEMA and NEM: WA and other associated environmental legislation. This has included a comprehensive stakeholder engagement process which has sought to identify stakeholders, provide these parties with an adequate opportunity to participate in the project process and guide technical investigations that have taken place as part of the Impact assessment phase of this study. Specialist input has been included for all key environmental aspects that were identified during the scoping phase of the process.

The positive and negative implications were assessed according to the construction, operational and decommissioning phases of the proposed project.

The proposed project will result in the prospering activities being undertaken for 5 years. These impacts were determined to have a positive impact, either directly or through the spinoffs generated by the development and operation of the proposed project and associated infrastructure.

In terms of local economy, there is the potential for multiple significant benefits to both local and regional businesses, as well as local employment opportunities. This would be highest, but temporary, during the construction phase, due to the requirement of contractors for services and materials. This has opportunities for both the formal and informal sectors, as smaller enterprises, including spaza shops, are likely to be established during the construction period to supply contractors and others with food and other amenities.

It is expected that Temla 13 will implement a policy allowing for preferential procurement for the local businesses and training of local SMMEs on procurement and business management.

The project is expected to have a positive socio-economic benefit through short term employment of locals. Recruitment of labour will be guided by Temla 13's recruitment policies which are expected to promote the employment of local labour by Temla 13 as well as by any appointed contractors. Temla 13 will ensure that a transparent process of employment will be followed to limit opportunities for conflict that may arise.

The information that will be obtained from the prospecting to be done will be necessary to determine, should minerals be found, how and where the different minerals will be extracted and how much economically viable reserves are available within the proposed prospecting area. This will allow Temla 13 to enter into further studies towards a Mining Right.

Should minerals be found in the project area, Temla 13 will be able to mine the available reserves. This will result in job creation and boost to local businesses is continued. Temla 13 expects that substantial benefits from the project (should minerals be found) will accrue to the immediate project area, the sub-region, and the province. This prospecting activity has a potential to decrease level of unemployment rate in proposed areas and surroundings. This prospecting activity will bring revenue into the city and the province which will in turn boost the economy of the country.

Various specialist studies were undertaken during the impact assessment phase of the proposed project, with the objective of identifying and weighing anticipated impacts and risks associated with the prospecting activities as well as in accordance with all relevant legislative requirements. All the identified impacts will be localised, short term and will have a medium and low significance. The significance of potential environmental impacts can be reduced to

medium-low and low significance with implementation of mitigation measures and monitoring. Concurrent or progressive rehabilitation of disturbed areas is standard good practice and should be undertaken as it will reduce Temla's environmental liability and costs at closure as rehabilitation is included in the operational activities of the proposed project.

During the construction phase of the proposed project the majority of the negative impacts are associated with site clearance and vegetation removal activities. Topsoil loss should be limited by storing and protecting the topsoil to be used for rehabilitation purposes.

Vegetation clearance during construction will also result in loss of natural vegetation and disturbance to fauna on site. Site clearance and vegetation removal will also result in a loss in land capability. Natural vegetation removal is expected to have moderate significance impacts. The biodiversity assessment shows that there are no protected biodiversity species (flora and fauna) that require special protection. It is however expected that there will be loss of flora and fauna species due to various project activities. The implementation of mitigation measures contained in Section 13 result in avoidance and/or minimisation of biodiversity impacts. Alteration of the sub catchment and increased sedimentation of surface water resources which may also impact aquatic biota may also occur due to the proposed prospecting project. The implementation of mitigation measures such as commencing rehabilitation activities in tandem with or immediately following construction will however reduce the duration and significance of the impacts. There are a number of wetlands located on the project site. The institution of the 32m buffer (no-go zone) as stipulated by the specialist as well as implementation of mitigation measures to manage potential edge effects will result in the protection of wetlands on the site. The HIA found that there is a burial site located on the project property that may be affected by the proposed project. It is however expected that the implementation of mitigation measured including demarcating the burial site and associated 100m buffer as no-go zones will result in the protection of the burial site. The main negative implications associated with other general construction activities are nuisance noise, traffic, dust, and visual impacts.

Drilling ground vibrations may result in possible damage to infrastructure and private property. With the implementation of mitigation measures, these impacts can be reduced to be of minor negative significance.

Furthermore, the operation of surface infrastructure and drilling process may lead to deterioration of water quality (surface and groundwater). Local spillages of hydrocarbons and chemicals used during the pre-construction and construction phase which may leach to groundwater. There is potential for leakages, spillages, and seepage of groundwater contaminants from infrastructure including the slimes dams and waste rock dump area.

There are a number of watercourses that traverse the project area. Movement and use of vehicles and machinery as well as improper storage of hazardous substance may have Impacts on surface water and groundwater quality due to accidental spillages of hazardous substances. Contaminated dirty water runoff from the prospecting area to surrounding areas resulting in the impact on local surface water quality. A stormwater management plan will be compiled and implemented to ensure that water resources are protected. The removal or containment of dirty water will result in the removal of MAR from the catchment, as this runoff will now be considered dirty water and will need to be contained.

Topsoil loss has been identified as a potential impact during the operational phase as a result of rainwater runoff and wind erosion from roads and soil stockpiles. In addition, alien vegetation may establish on the topsoil. This can be prevented by planting indigenous grass mixture, which will also assist in erosion reduction.

Ineffective rehabilitation of construction areas will lead to proliferation of alien invasive plant species. Similar to the construction phase, nuisance noise, dust and visual impacts are expected from general operation activities. All of these impacts can be mitigated.

The residual risk associated with the proposed project will largely relate to water management and rehabilitation following the operational phase. According to the hydrology specialist study, should the identified mitigation measures be implemented, the anticipated decrease in water quality attributable to increased pollutant load could be greatly reduced. Accordingly, the impact significance on drainage lines and wetlands downstream could be classified as minor during the construction and operation phases of the project, and negligible significance during the decommissioning phase. These monitoring requirements have been addressed in the EMPr.

Monitoring plans, which should be implemented throughout the life of the project, have also been provided to ensure that adverse impacts are reduced, and continuous improvements are made.

With the correct and effective mitigation and management measures, the proposed project is deemed feasible and desirable. Furthermore, the indirect impacts from the proposed development could cause negative impacts on the surrounding natural environment, unless this is also managed and monitored in order to address adverse impacts immediately. Rehabilitation must be implemented based on best practice principles and the DMR, DWS and DFFE should monitor activities during the construction, operational and closure phases of the proposed project.

An EMPr has been compiled as part of this EIA to ensure the mitigation of these impacts as far as practicable. It is anticipated that it will be possible to mitigate the environmental impacts to acceptable levels and the implementation will be monitored and audited to determine the effectiveness of the measures implemented. The EMPr is considered adequate to assist the project in striving towards the principles of the NEMA.

The project team believes that the EIA undertaken for the proposed prospecting project fulfils the process requirements of the NEMA and the NEM: WA. The EAP recommends that an EA/WML be issued by the DMR and that the construction and operation of the project should be conducted under duty of care and must be in accordance with the recommendations that were included in this EIA/EMPr Report as well as conditions that will be included in the EA/WML by the DMR.

# 45 Undertaking regarding correctness of information

I Ndivhudzannyi Mofokeng herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and I&APs has been correctly recorded in the report.

Signature of the EAP

DATE: 23 June 2023

# 46 Undertaking regarding inclusion of comments and inputs from stakeholders and I&APs

I, Ndivhudzannyi Mofokeng herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and I&APs have been correctly recorded in the report.

Signature of the EAP

DATE: 23 June 2023

# 47 Undertaking regarding inclusion of inputs and recommendations from the specialist reports

I, Ndivhudzannyi Mofokeng herewith undertake that the information provided in the foregoing report is correct, and that the inputs and recommendation from the specialist reports have been included in the EIA/EMPr Report.

Signature of the EAP

DATE: 23 June 2023

# 48 Undertaking regarding the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed

I, Ndivhudzannyi Mofokeng herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and I&APs has been correctly recorded in the report.

Signature of the EAP

DATE: 23 June 2023

# 49 Statement of Ndi Geological Consulting Services (Pty) Ltd independence

Neither Ndi Geological Consulting Services nor any of the authors of this report have any material present or contingent interest in the outcome of this report, nor do they have any pecuniary or other interest that could be reasonably regarded as being capable of affecting their independence or that of Ndi Geological Consulting Services.

Ndi Geological Consulting Services has no prior association with Temla 13 in regard to the mineral assets that are the subject of this report. Ndi Geological Consulting Services has no beneficial interest in the outcome of the technical assessment being capable of affecting its independence.

Ndi Geological Consulting Service's fee for completing this report is based on its normal professional daily rates plus reimbursement of incidental expenses. The payment of that professional fee is not contingent upon the outcome of the report.

# 50 References

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All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

# Appendices

# Appendix 1: EAP Qualifications

# Appendix 2: EAP CVs

# Appendix 3: DMR Scoping Report and Plan of Study Acceptance Letter

# Appendix 4: Locality Map

# Appendix 5: Stakeholder Engagement Documentation

# Appendix 6: Specialist Studies Reports

# Appendix 7: Project Composite Map

# Appendix 8: Impact Assessment Tables